THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - CONSTRUCTION
STATE BRIDGE #53C-1564, LA COUNTY BRIDGE #2482

PROJECT DIRECTORY

CLIENT / OWNER
CITY OF TORRANCE
20500 MADRONA AVENUE
TORRANCE, CA 90503

CONTACT
BETH OVERSTREET, P.E.
310.618.3074
EOVERSTREET@TORRANCECA.GOV

LEA REIS
310.618.3055
LREIS@TORRANCECA.GOV

STRUCTURAL ENGINEER
KRAKOWER & ASSOCIATES
160 WHITE OAK DRIVE
ARCADIA, CA 91006

CONTACT
MICHAEL KRAKOWER
626.355.6088
MKCASE@VERIZON.NET

PRESERVATION CONSULTANT
CHATTEL ARCHITECTURE PLANNING & PRESERVATION, INC.
13417 VENTURA BOULEVARD
SHERMAN OAKS, CA 91423

CONTACT
ROBERT CHATTEL
818.788.7954 x3
ROBERT@CHATTEL.US

SHANE STUART SWERDLOW
818.788.7954 x5
SHANE@CHATTEL.US

CONSTRUCTIBILITY
PRESERVATION ARTS
8600 VENICE BOULEVARD
LOS ANGELES, CA 90034

CONTACT
CHARLES KIBBY
310.558.8003
CKIBBY@PRESERVATIONARTS.NET

LORETTA CIMMARUSTI
310.558.8003
LCIMMARUSTI@PRESERVATIONARTS.NET

LIGHTING & ELECTRICAL
BOLTON ENGINEERING CORP.
25834 NARBONNE AVENUE #210
LOMITA, CA 90717

CONTACT
DAN BOLTON
310.325.5580
DBOLTON@BOLTONENGINEERING.COM

TORRANCE HISTORICAL SOCIETY, DATE UNKNOWN, BUT SOON AFTER CONSTRUCTION

HISTORICAL SIGNIFICANCE

LOCATED IN TORRANCE, CALIFORNIA AND DESIGNED BY IRVING GILL, THE PACIFIC ELECTRIC RAILROAD BRIDGE WAS CONSTRUCTED IN 1913. IT IS AN EARLY EXAMPLE OF MULTI-SPAN REINFORCED CONCRETE CONSTRUCTION AND FEATURES DISTINCTIVE HOLLOW ARCHED REINFORCED CONCRETE FACADES COVERING THE CONVENTIONAL STRUCTURAL SYSTEM. THE BRIDGE WAS LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES IN 1989 UNDER CRITERION C AND IS SIGNIFICANT IN THREE AREAS: COMMUNITY PLANNING, ARCHITECTURE AND ENGINEERING. IN THE AREA OF COMMUNITY PLANNING IT IS A RARE EXTANT ELEMENT OF THE ORIGINAL TORRANCE GENERAL PLAN. THE BRIDGE DESIGN EXEMPLIFIES THE DISTINCTIVE UNDERSTATED STYLE OF IRVING GILL, AN INFLUENTIAL PIONEER IN THE MODERN MOVEMENT OF ARCHITECTURE. IN THE AREA OF ENGINEERING, THE USE OF THE DECORATIVE ARCHES TO DISGUISE AN OTHERWISE CONVENTIONAL STRUCTURAL SYSTEM REPRESENTS A UNIQUE CONSTRUCTION APPROACH. PERIOD OF SIGNIFICANCE FOR THE BRIDGE IS 1913.

SHEET INDEX

SCOPE OF WORK

PHASE ONE MAINTENANCE INCLUDING SPALL REPAIR, CRACK INJECTION, GUARDRAIL REPLACEMENT, VEGETATION REMOVAL, SURFACE CLEANING, GRAFFITI MITIGATION AND LIGHTING.

CODES AND STANDARDS

STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
CALIFORNIA HISTORICAL BUILDING CODE
SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES: REHABILITATION TREATMENT APPROACH
NATIONAL ELECTRICAL CODE
CAL TRANS STANDARD SPECIFICATIONS

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - TITLE SHEET

REV.	DATE	DESCRIPTION	BY	CHECKED

REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT
DESIGNED: Krakower and Associates
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET

APPROVED:
7/3/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 1 OF 18
PLAN NO. ST-1049 | SHEET No. TS

GENERAL NOTES
THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION

CONCRETE SPALL PATCHING AND REPAIR

1. LAYOUTS OF OBSERVED SPALLS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY FOR BIDDING PURPOSES. CONTRACTOR SHALL ESTABLISH A TOTAL COST FOR 85 SQUARE FEET OF TOTAL REPAIR AND A UNIT COST PER SQUARE FOOT TO ALLOW FOR DISCOVERED CONDITIONS.
2. REMOVE ALL LOOSE CONCRETE BACK TO SOUND SUBSTRATE. CUT THE EDGES OF THE REPAIR AREA TO A MINIMUM DEPTH OF ONE INCH. CUTS SHOULD BE MADE EITHER BE PARALLEL OR PERPENDICULAR TO THE ORIENTATION OF THE ORIGINAL FORM BOARDS MARKS ONLY. CUTS PARALLEL TO THE ORIGINAL FORM BOARDS SHALL BE ALIGNED WITH EXISTING JOINTS BETWEEN THE BOARD FORMS. OVER-CUTS BEYOND THE LIMITS OF THE REPAIR PERIMETER ARE NOT ALLOWED. FEATHERED EDGES AT THE REPAIR PERIMETER ARE NOT ALLOWED.
3. EXPOSED REINFORCING STEEL WITHIN THE LIMITS OF THE PATCH AREA SHALL BE TREATED AS FOLLOWS. CHIP OUT CONCRETE ALL AROUND THE EXPOSED REINFORCING TO ONE BAR DIAMETER MINIMUM CLEARANCE. REMOVE LOOSE DEBRIS AND SCALE BY WIRE BRUSHING AND APPLY ANTI-CORROSION TREATMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. SEVERELY DETERIORATED REINFORCING STEEL SHALL BE REMOVED AND REPLACED IN KIND BACK TO SOUND REINFORCING. LAP EXISTING REINFORCING 30 BAR DIAMETERS OR PROVIDE MECHANICAL COUPLERS.
4. FOR REPAIR AREAS EXCEEDING 2 SQUARE FEET, INSTALL ¼ INCH DIAMETER STAINLESS STEEL SCREW ANCHORS AT 12 INCHES ON CENTER EACH WAY INTO THE PREPARED AREA TO BOND THE PATCHING MORTAR. EMBED THE ANCHORS 1.5 INCHES INTO THE SOUND CONCRETE AND PROVIDE 1.5 INCHES OF CONCRETE COVER OVER THE HEAD OF THE SCREW. AT SOFFIT AND OVERHEAD AREAS, ADD STAINLESS STEEL WIRE MESH BETWEEN THE SCREW ANCHORS.
5. CLEAN ALL DUST AND DEBRIS FROM THE PREPARED SURFACES AND PRE-SATURATE THE SUBSTRATE TO SURFACE DRY TO REDUCE ABSORPTION OF MOISTURE FROM THE SUBSEQUENT REPAIR MORTAR. RE-WET THE SURFACE JUST PRIOR TO APPLYING THE REPAIR MORTAR.
6. APPLY THE REPAIR MORTAR IN LIFTS NOT TO EXCEED 2 INCHES IN THICKNESS. WORK THE MORTAR FIRMLY INTO THE REPAIR SURFACES INCLUDING THE CORNERS AND UNDER AND AROUND REINFORCING STEEL. BUILD UP THE REPAIR MORTAR TO SLIGHTLY ABOVE THE ADJACENT CONCRETE SURFACES PRIOR TO FINISHING. MATCH THE ADJACENT BOARD FORM APPEARANCE OF THE EXISTING ADJACENT CONSTRUCTION.
7. CURE THE FINISHED REPAIRS WITH MISTING SEVERAL TIMES A DAY FOR THREE CONSECUTIVE DAYS MINIMUM.
8. PREPARE A TEST PANEL UNDER THE DIRECTION OF THE DESIGN TEAM AND CITY OF TORRANCE TO DEMONSTRATE THE REPAIR TECHNIQUES PRIOR TO THE CONSTRUCTION. THE TEST PANEL AREA MAY BE USED AS PART OF THE FINISHED CONSTRUCTION.

SCAFFOLDING (IF USED)

1. CONTRACTOR SHALL SUBMIT COMPLETE SCAFFOLDING LAYOUT, INSTALLATION, BRACING AND DISMANTLING DRAWINGS INCLUDING ENGINEERING COMPUTATIONS FOR FIXED AND MOBILE SCAFFOLDING PLACEMENT TO SAFELY EXECUTE ALL THE WORK PRIOR TO THE START OF CONSTRUCTION. DRAWINGS AND COMPUTATIONS SHALL BE SIGNED BY A LICENSED CIVIL OR STRUCTURAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF CALIFORNIA. OBTAIN ALL NECESSARY PERMITS AND CLEARANCES FROM THE REVIEWING AUTHORITIES HAVING JURISDICTION FOR THE BRIDGE. CONTRACTOR SHALL HAVE A MINIMUM OF 5 YEARS OF EXPERIENCE WITH DESIGN, CONSTRUCTION AND DISMANTLING OF SCAFFOLDING FOR DESIGNATED HISTORIC BRIDGES.
2. SCAFFOLDS SHALL BE ERECTED, MAINTAINED, MOVED, DISMANTLED AND/OR ALTERED BY EXPERIENCED PERSONNEL ONLY UNDER THE SUPERVISION AND DIRECTION OF A COMPETENT PERSON DEFINED IN OSHA SECTION 1926.451. PRIOR TO THE START OF ERECTION, A SITE INSPECTION SHALL BE MADE TO CHECK FOR HAZARDS.
3. CONTRACTOR SHALL PROVIDE MEANS AND METHODS TO SAFELY AND LAWFULLY COLLECT AND DISPOSE OF ALL MATERIALS USED TO PREPARE, TREAT, REPAIR, CLEAN AND FINISH ALL SURFACES. DO NOT ALLOW DEBRIS AND RUBBLE TO ACCUMULATE ON PLANKING OR AROUND SCAFFOLDING AND SHALL BE REMOVED AS QUICKLY AS POSSIBLE. PROVIDE ENCLOSED SCAFFOLDING AND TOE-BOARDS WHERE REQUIRED, PROTECTING ADJACENT RIGHTS OF WAY.
4. ALL TEMPORARY ATTACHMENTS TO BRIDGE SURFACES SHALL BE REMOVED, REPAIRED AND FINISHED IN ACCORDANCE WITH THE REQUIREMENTS FOR CRACK AND SPALL REPAIR.
5. CONTRACTOR SHALL MAINTAIN MINIMUM CLEARANCES ABOVE AND AROUND ROADS, SIDEWALKS AND RAILROAD RIGHTS OF WAY AS SPECIFIED IN THE SPECIFICATIONS AND BY THE REVIEWING AUTHORITIES HAVING JURISDICTION FOR THE BRIDGE.

CAST IN PLACE CONCRETE

1. CONCRETE SHALL OBTAIN A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 2500 PSI AT 28 DAYS AND BE PROPORTIONED AS FOLLOWS.
2. MAXIMUM SIZE AGGREGATE SHALL BE 3/8 INCH.
3. MINIMUM OF 7 SACKS OF CEMENT PER CUBIC YARD.
4. MAXIMUM OF 70 % SAND AND MINIMUM OF 30 % COARSE AGGREGATE.
5. MAXIMUM OF 7 GALLONS WATER PER CEMENT SACK.
6. UP TO 15% FLY-ASH MAY BE ADDED FOR PUMPING.
7. MAXIMUM SLUMP IS 5 INCHES.
8. REINFORCING SHALL HAVE THE FOLLOWING MINIMUM PROTECTIVE COVER OF CONCRETE:

CONCRETE POURED AGAINST EARTH	3 INCHES
FORMED CONCRETE SURFACES IN CONTACT WITH EARTH	2 INCHES
FORMED CONCRETE SURFACES EXPOSED TO WEATHER	1.5 INCHES
FORMED CONCRETE SURFACES IN INTERIOR SPACES	0.75 INCHES

9. AGGREGATE SHALL CONFORM TO ASTM C-33.
10. CEMENT SHALL CONFORM TO ASTM C 150 TYPE II.
11. SUBMIT PROPOSED MIX DESIGNS FOR REVIEW AND APPROVAL PRIOR TO START OF CONSTRUCTION.
12. COORDINATE ALL UTILITIES AND OTHER EMBEDS PRIOR TO CASTING CONCRETE.

STRUCTURAL STEEL

1. ALL ROLLED SHAPES, PLATES AND STEEL ALL THREAD SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED ON THE PLANS.
2. WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS WITH E 70XX ELECTRODES. ALL WELDING SHALL BE CONTINUOUSLY INSPECTED EXCEPT WHEN PERFORMED IN THE SHOP OF A LICENSED FABRICATOR.
3. ALL STRUCTURAL STEEL SHALL HAVE A PRIMER AND FINISHED COAT EXCEPT WHEN CONCEALED IN CONCRETE.

ROUGH CARPENTRY

1. ALL LUMBER SHALL BE DOUGLAS FIR, GRADED AND GRADE STAMPED IN ACCORDANCE WITH STANDARD GRADING RULES 17 OF THE WEST COAST LUMBER INSPECTION BUREAU.
2. ALL LUMBER SHALL BE DOUGLAS FIR # 1.
3. ANY WOOD MEMBER IN CONTACT WITH CONCRETE SHALL BE PRESSURE TREATED
4. NAILING SHALL CONFORM TO TABLE 2304.9 OF THE CALIFORNIA BUILDING CODE.
5. PRE-DRILL HOLES (3/4 TIMES THE NAIL DIAMETER) FOR NAILING WHERE DRIVING SPLITS ANY FRAMING. AIR DRIVEN NAILS SHALL BE FULL HEADED. DO NOT OVER-DRIVE NAILS
6. PRE-DRILL HOLES FOR LAG SCREWS AND WOOD SCREWS (7/8 TIMES THE DIAMETER OF THE FASTENER). FASTENERS MAY BE LUBRICATED WITH SOAP OR WAX TO FACILITATE INSTALLATION. DO NOT DRIVE ANY SCREWS OR LAGS.
7. PRE-MANUFACTURED FRAMING CONNECTORS SHALL HAVE THE DESIGNATED FASTENERS INSTALLED WITH THE CONNECTOR.

CRACK REPAIR BY GROUT INJECTION

1. CRACK REPAIR SHALL BE PERFORMED ONLY BY QUALIFIED APPLICATORS AND FIELD PERSONNEL WITH A MINIMUM OF 5 YEARS' EXPERIENCE WITH THE BLIND INJECTION TECHNIQUE FOR DESIGNATED HISTORIC CONCRETE STRUCTURES. THE FIELD PERSONNEL SHALL HAVE A MINIMUM OF 5 YEARS EMPLOYMENT WITH THE APPLICATOR.
2. ACCESS TO BOTH SIDES OF CRACKS, IN GENERAL, IS NOT POSSIBLE. PER THE RECORD DRAWINGS, ALL THE ARCHES ARE HOLLOW REINFORCED CONCRETE SECTIONS APPROXIMATELY 4 TO 6 INCHES THICK. LAYOUTS OF OBSERVED CRACKS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY FOR BIDDING PURPOSES. CONTRACTOR SHALL ESTABLISH A TOTAL COST FOR 1,100 LINEAR FEET OF CRACK INJECTION AND A UNIT COST PER LINEAR FOOT TO ALLOW FOR REPAIR OF DISCOVERED CONDITIONS.
3. THE APPLICATOR SHALL SUBMIT A WRITTEN DESCRIPTION OF THEIR EXPERIENCE, PROPOSED SURFACE PREPARATION, GROUT MATERIALS, INJECTION PROCEDURES, FINISHING OF THE SURFACE OF THE CRACK REPAIR TO MATCH ADJACENT SURFACES AND CLEAN-UP FOR REVIEW BY THE DESIGN CONSULTANTS AND CITY OF TORRANCE AT LEAST 15 DAYS PRIOR TO THE START OF CONSTRUCTION. THE WRITTEN DESCRIPTION SHALL INCLUDE, BUT NOT BE LIMITED TO, EXPOSING AND CLEANING OF CRACKS; SPACING AND SEALING OF SURFACE MOUNTED INJECTION PORTS; INJECTION EQUIPMENT; INJECTION MATERIAL; STAGGERED INJECTION SEQUENCES IN SMALLER INCREMENTS FOR PROPER CURE AND BONDING TO MINIMIZE LOSS OF INJECTED MATERIALS INTO HOLLOW CONCRETE ARCHES; AND REMOVAL OF THE SEALANT WITH FINAL CLEAN-UP.
4. A PRE-QUALIFICATION TESTING PROGRAM SHALL BE DEVELOPED AND PERFORMED ON A SMALL SECTION OF THE BRIDGE TO VERIFY THE CRACK REPAIR PROCEDURES AND APPEARANCE. TESTING SITES SHALL BE SELECTED BY THE DESIGN CONSULTANTS AND CITY OF TORRANCE TO MINIMIZE VISUAL IMPACTS TO THE CHARACTER DEFINING FEATURES. PREPARE AND INJECT A 2 FOOT LONG SECTION OF CRACK AND ALLOW CURING AND BONDING. EXTRACT A 2 INCH DIAMETER CORE AND TEST TO FAILURE IN COMPRESSION. IF NO FAILURE OF THE GROUT BOND IS OBSERVED, THE TEST SHALL BE JUDGED SATISFACTORY. IN THE EVENT THE TEST RESULTS ARE NOT SATISFACTORY, CONTRACTOR AT HIS OWN EXPENSE SHALL DEVELOP ALTERNATE PROCEDURES, SUBSTANTIATED BY TESTING, TO ACHIEVE COMPLIANCE. TESTING SITES MAY BE INCLUDED IN THE FINAL WORK. REPAIR ALL CORES PER REQUIREMENTS FOR SPALL REPAIR. DO NOT PROCEED WITH THE CRACK REPAIR UNTIL THE PRE-QUALIFICATION TESTING IS COMPLETED AND APPROVED.

GENERAL NOTES
THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION

SCOPE OF WORK

1. LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES, THE PACIFIC ELECTRIC RAILROAD BRIDGE (STATE BRIDGE # 53C-1564, LA COUNTY BRIDGE # 2482) IS CONSTRUCTED WITH REINFORCED CONCRETE. SOME OF THE DEFERRED MAINTENANCE IS SUMMARIZED IN A LOS ANGELES COUNTY BRIDGE INSPECTION REPORT DATED 8/30/11. THE SCOPE OF WORK FOR THIS PHASE OF THE PROJECT INCLUDES, BUT IS NOT LIMITED TO, DOCUMENTATION OF THE AS FOUND CONDITIONS; IN-KIND REPLACEMENT OF THE DETERIORATED WOODEN GUARDRAIL; BLIND GROUT INJECTION OF CRACKS, PATCHING AND REPAIR OF SURFACE DETERIORATION; REMOVAL OF ALL VEGETATION GROWING ON BRIDGE SURFACE AND NEW LIGHTING.
2. LIMITS OF THE REHABILITATION SHOWN IS APPROXIMATE BASED UPON NON-DESTRUCTIVE OBSERVATION OF ACCESSIBLE SURFACES. PERCEIVED DISCOVERED CONDITIONS THAT PREVENT CONFORMANCE TO THE DRAWINGS AND SPECIFICATIONS SHALL BE REPORTED TO THE ENGINEER AND APPROVED BY THE CITY OF TORRANCE PRIOR TO THE AUTHORIZATION OF ADDITIONAL WORK.
3. THESE GENERAL NOTES ARE EXCERPTED, IN PART, FROM THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AND THE PROJECT SPECIFICATIONS FOR GENERAL INFORMATION ONLY. IN CASE OF A CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE MORE RESTRICTIVE REQUIREMENT SHALL GOVERN UNLESS OTHERWISE NOTED.
4. REHABILITATION ACKNOWLEDGES THE NEED TO ALTER OR ADD TO A HISTORIC PROPERTY TO MEET CONTINUING OR CHANGING USES WHILE RETAINING THE PROPERTY'S HISTORIC CHARACTER. RETAIN EXISTING HISTORIC MATERIALS TO THE GREATEST EXTENT FEASIBLE; REPAIR RATHER THAN REPLACE, UNLESS INSTRUCTED OTHERWISE.

STAGING AND PROTECTION OF THE REHABILITATION

1. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE STAGING AND PROTECTION OF THE REHABILITATION INCLUDING ADJACENT PUBLIC PROPERTY, PRIVATE PROPERTY, RAILROAD EASEMENT, EXISTING UTILITIES AND OTHER RIGHTS OF WAY. OBTAIN ALL NECESSARY PERMITS TO PERFORM THE WORK.
2. THE CONTRACTOR'S OPERATIONS SHALL COMPLY WITH ALL APPLICABLE STATE, COUNTY AND CITY REQUIREMENTS FOR THE WORK. PROVIDE BARRIERS, GUARDS, LIGHTS, SIGNS, TEMPORARY BRIDGES, FLAG PERSONS AND WATCH PERSONS AND SIMILAR SAFETY PRECAUTIONS TO ADVISE THE PUBLIC OF DETOURS AND CONSTRUCTION HAZARDS. UNLESS OTHERWISE AUTHORIZED, TRAFFIC AND PEDESTRIANS SHALL BE PERMITTED TO PASS THROUGH THE WORK. AT LEAST 10 DAYS IN ADVANCE OF CLOSING, PARTIALLY CLOSING OR REOPENING OF PUBLIC THOROUGHFARES, NOTIFY CITY OF TORRANCE AND/OR OTHER JURISDICTIONS AND OBTAIN REQUIRED PERMITS.
3. STORAGE OF EQUIPMENT AND MATERIALS SHALL BE CAREFULLY COORDINATED WITH THE CITY OF TORRANCE AND SHALL NOT OBSTRUCT PUBLIC RIGHTS OF WAY, EASEMENTS OR PRIVATE PROPERTY UNLESS OTHERWISE DIRECTED.

FOUNDATIONS

1. REVIEW OF RECORD DRAWINGS PREPARED IN 1914 SHOW CONTINUOUS AND ISOLATED REINFORCED CONCRETE FOOTINGS UNDER BRIDGE COLUMNS AND ABUTMENTS. THE CONCRETE RETAINING WALL ON LINE 1 BETWEEN LINES D AND E HAS EVIDENCE OF PAST DIFFERENTIAL SETTLEMENT IN THE CRACK PATTERN OF DETAIL 1/S3.3. NO OTHER EVIDENCE OF SUB-GRADE SETTLEMENT WAS NOTED IN THE SURVEY. A GEOTECHNICAL INVESTIGATION OF THE SITE SUB-GRADE AND REGIONAL GEOLOGY IS NOT PART OF THIS PHASE.

FORMWORK

1. ERECT FORMWORK IN ACCORDANCE WITH ACI 301 WITH TOLERANCES REQUIRED BY ACI 117.
2. PROTECT EXISTING ADJACENT SURFACES FROM CONCRETE SPILLAGE AND OTHER DEBRIS DURING CONCRETE PLACEMENT.

REINFORCING STEEL

1. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60.
2. STEEL ALL-THREAD SHALL CONFORM TO ASTM A-36 UNLESS OTHERWISE NOTED ON THE DRAWINGS.
3. FABRICATE REINFORCING STEEL IN ACCORDANCE WITH THE CURRENT CRSI MANUAL OF STANDARD PRACTICE AND ACI 318.
4. ACCURATELY POSITION REINFORCING STEEL AND PREVENT IT FROM DISPLACING DURING CONCRETE PLACEMENT OPERATIONS.
5. TERMINATE REINFORCING STEEL WITH STANDARD 90 OR 180 DEGREE HOOKS UNLESS OTHERWISE NOTED. BARS MARKED CONTINUOUS MAY BE PLACED IN CONVENIENT LENGTHS AND LAPPED 30 BAR DIAMETERS.

POST INSTALLED ANCHORS IN CONCRETE

1. EPOXY RESIN ANCHOR SYSTEMS SHALL BE A TWO COMPONENT HIGH SOLIDS EPOXY SYSTEM BY SIMPSON SET, HILTI OR EQUAL WITH A CURRENTLY APPROVED ICC-ESR-ES REPORT.
2. INSTALL THE EPOXY RESIN ANCHORS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
3. POST INSTALLED ANCHORS SHALL BE INSTALLED BY ROTARY NON-IMPACT TYPE TOOLS ONLY.

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcose@verizon.net

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THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - GENERAL NOTES

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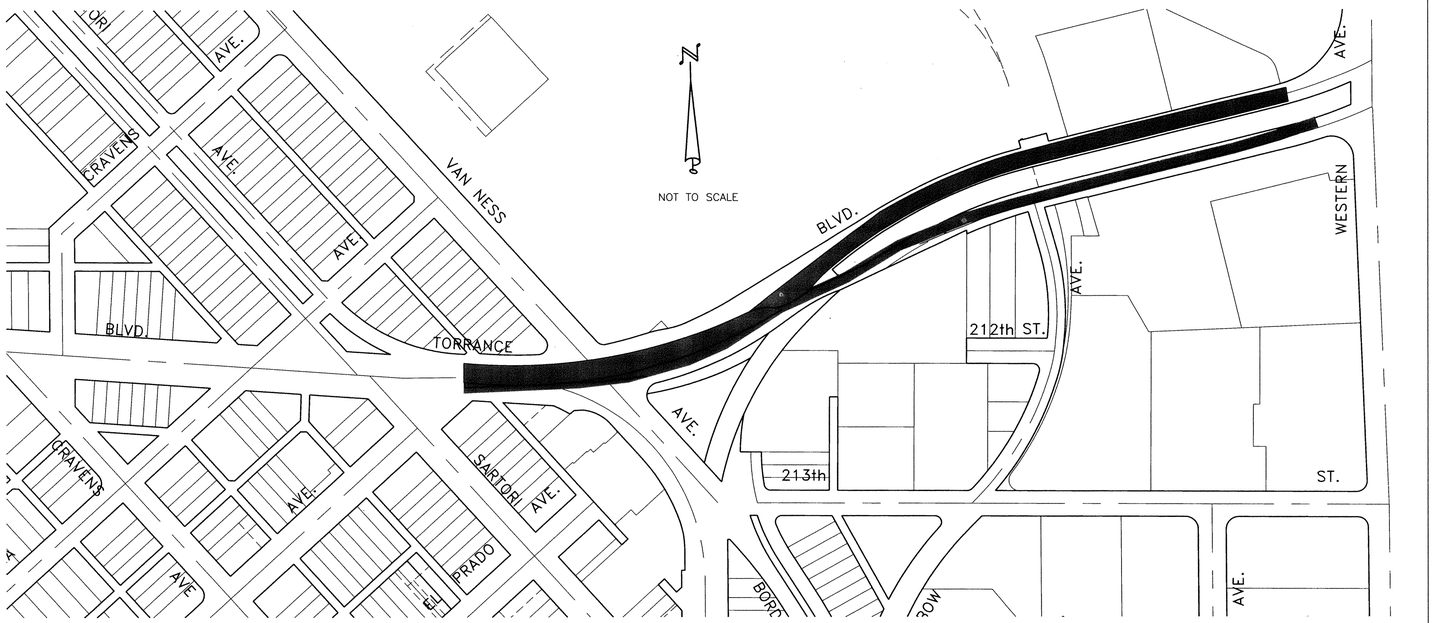
SCALE: AS SHOWN | SHEET 2 OF 18
PLAN NO. ST-1049 | SHEET No. S1.1

TRAFFIC CONTROL GENERAL NOTES

1. ALL TRAFFIC CONTROL WORK FOR CONSTRUCTION SHALL CONFORM TO PART 6, "TEMPORARY TRAFFIC CONTROL," OF THE LATEST EDITION OF THE CALIFORNIA MUTCD. SIGNS SHALL BE STANDARD UNLESS NOTED OTHERWISE.
2. EXACT LOCATION OF ALL TRAFFIC CONTROL DEVICES SHALL BE AS DIRECTED BY ENGINEER BASED ON CONSTRUCTION CONDITIONS. ADDITIONAL WARNING OR CONSTRUCTION SIGNS MAY BE REQUIRED BY THE ENGINEER.
3. ALL NIGHT TIME WORK SHALL BE APPROVED IN ADVANCE BY THE ENGINEER.
4. STREET CLOSURES SHALL BE APPROVED BY THE ENGINEER WHENEVER APPLICABLE. RESIDENTS/BUSINESSES SHALL BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
5. PRESSURE SENSITIVE DETOUR GRADE TRAFFIC MARKING TAPE AND/OR TEMPORARY FLEXIBLE RAISED PAVEMENT MARKERS MAY BE REQUIRED TO SUPPLEMENT THE CHANNELIZING DEVICES, DRUMS, REFLECTORIZED SIGNS, PAINT, AND BARRICADES AS DIRECTED BY THE ENGINEER.
6. ALL ADVANCE WARNING SIGN INSTALLATIONS SHALL BE EQUIPPED WITH FLAGS FOR DAYTIME CLOSURES.
7. ALL SIGNS SHALL BE REFLECTORIZED AND STANDARD SIZE, UNLESS NOTED OTHERWISE. ALL W20-1, W20-5, AND W4-2 SIGNS SHALL BE MINIMUM 36" x 36".
8. ALL DRUMS SHALL BE 36" MINIMUM HEIGHT, PORTABLE, WITH REFLECTORIZED 4"-6" WHITE AND ORANGE STRIPES, WITH WEIGHTED BASES OR BALLAST RINGS. DRUMS SHALL BE MADE OF A FLEXIBLE MATERIAL, 18"-36" IN DIAMETER AND SHALL BE KEPT IN THEIR PROPER POSITION AT ALL TIMES, AND SHALL BE REPAIRED, REPLACED OR CLEANED AS NECESSARY TO PRESERVE THEIR APPEARANCE AND CONTINUITY. DRUMS FOR NIGHT TIME USE SHALL BE PROVIDED WITH FLASHING WARNING LIGHTS.
9. TYPE II BARRICADES MAY BE USED IN ADDITION TO THE DRUMS, AT THE DISCRETION OF THE CONTRACTOR, WHEN THEY ARE INTENDED TO PROVIDE ADDITIONAL EMPHASIS IN AREAS WHERE WORKERS ARE PRESENT.
10. USE AND PLACEMENT OF FLASHING ARROW BOARD(S) AND CHANGEABLE MESSAGE SIGN(S) SHALL BE AS DIRECTED BY THE ENGINEER.
11. THE CONTRACTOR SHALL MAINTAIN, ON A 24-HOUR BASIS, ALL SIGNS, DRUMS, BARRICADES, ETC., TO ENSURE PROPER FLOW AND SAFETY OF TRAFFIC.
12. THE CONTRACTOR SHALL UTILIZE FLAGGERS DURING WORK HOURS AS DEEMED NECESSARY BY THE ENGINEER.
13. THE CONTRACTOR SHALL HAVE ALL SIGNS, DRUMS, BARRICADES, ETC., PROPERLY INSTALLED PRIOR TO COMMENCING CONSTRUCTION AND BEFORE ATTEMPTING TO SWITCH TO A SUBSEQUENT STAGE DURING WORK HOURS.
14. CONSTRUCTION OPERATIONS SHALL BE CONDUCTED IN SUCH A MANNER AS TO CAUSE AS LITTLE INCONVENIENCE AS POSSIBLE TO ABUTTING BUSINESSES AND PROPERTY OWNERS.
15. CONSTRUCTION TRUCK TRAFFIC MERGING INTO TRAFFIC LANES SHALL BE DONE BY USE OF FLAGGER AND APPROPRIATE SIGNAGE AS DIRECTED BY ENGINEER.
16. FLASHING ARROW SIGNS (F.A.S.) AND PORTABLE CHANGEABLE MESSAGE SIGNS (P.C.M.S.) SHALL CONFORM TO THE SPECIAL PROVISIONS AND BE EITHER SOLAR OR BATTERY OPERATED. GASOLINE AND DIESEL POWERED F.A.S. AND P.C.M.S. ARE PROHIBITED.
17. ALL STRIPING AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AND REFLECTORIZED PER CALTRANS SPECIFICATIONS UNLESS OTHERWISE NOTED.
18. NO TWO CONSECUTIVE CROSS STREETS SHALL BE SIMULTANEOUSLY CLOSED FOR CONSTRUCTION.
19. ALL WORK IN EACH PHASE SHALL BE COMPLETE BEFORE WORK IN ANOTHER PHASE MAY BEGIN.
20. TRAFFIC SIGNALS (EXISTING, NEW OR TEMPORARY) SHALL BE IN OPERATION AT ALL TIMES AT SIGNALIZED INTERSECTIONS.
21. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF FOUR PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS). USE, PLACEMENT AND FLASHING MESSAGE TEXT SHALL BE AS DIRECTED BY THE ENGINEER. PAYMENT IS INCLUDED IN THE UNIT PRICE FOR "PORTABLE CHANGEABLE MESSAGE SIGNS".
22. TEMPORARY "NO PARKING – TOW AWAY" SIGNS SHALL BE POSTED WITHIN AFFECTED CONSTRUCTION AREAS A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.

PROJECT VICINITY MAP



NOT TO SCALE

NOTES:

ROAD CLOSURES ON TORRANCE BLVD. ARE ONLY ALLOWED BETWEEN THE HOURS OF 8:00 AM TO 6:00 PM ON SATURDAY AND SUNDAY. NO WEEKDAY ROAD CLOSURES WILL BE PERMITTED FOR THE WORK:

CONTRACTOR SHALL CONTACT THE TORRANCE TRAFFIC AND LIGHTING SUPERVISOR, RICHARD HALL, AT (310) 781-6900 (OFFICE) TO INQUIRE ON AND COORDINATE ANY MODIFICATIONS TO THE TRAFFIC SIGNAL TIMINGS ON TORRANCE BLVD.

LEGEND

- TYPE II BARRICADE WITH SIGN AS NOTED ON PLAN.
- TYPE III BARRICADE WITH SIGN AS NOTED ON PLAN.
- SIGN (AS NOTED ON PLAN)
- REFLECTORIZED DRUM
- 39" DELINEATOR OR 28" CONE WITH REFLECTIVE BAND
- DIRECTION OF TRAVEL
- FLASHING ARROW BOARD (FAS) SIGN
- FLAGTREE AND SIGN
- ANGLE POINT
- 12' CONSTRUCTION LANE DIMENSION
- 12' EXISTING LANE DIMENSIONS
- WORK AREA
- CMS CHANGEABLE MESSAGE SIGN

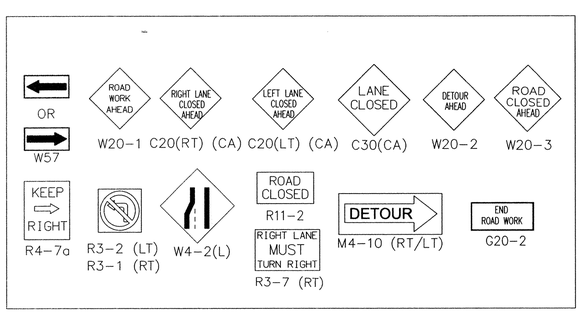
PORTABLE CHANGEABLE MESSAGE SIGN

ROAD WORK AHEAD

CMS SCREEN 1
(FLASH FOR 2 SECONDS)

EXPECT DELAYS

CMS SCREEN 2
(FLASH FOR 2 SECONDS)



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UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
No. 2443
EXP. 3-31-13
STRUCTURAL
STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-8394
e-mail: mkcase@verizon.net

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - TRAFFIC CONTROL

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REV.	DATE	DESCRIPTION	BY	CHECKED

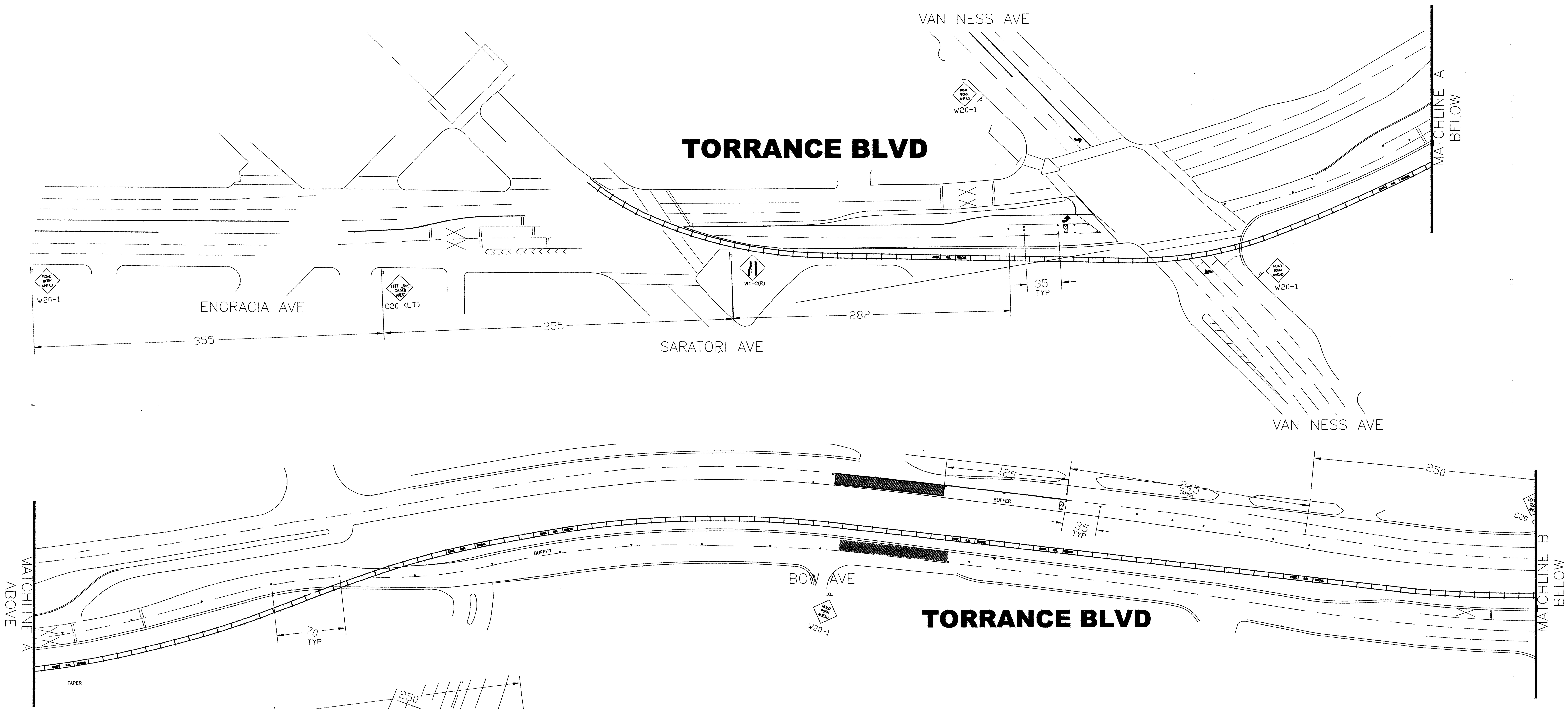
REGISTERED PROFESSIONAL ENGINEER
TOUFIC J. SEMAAN
No. C59226
Exp. 6/30/13
CIVIL
STATE OF CALIFORNIA

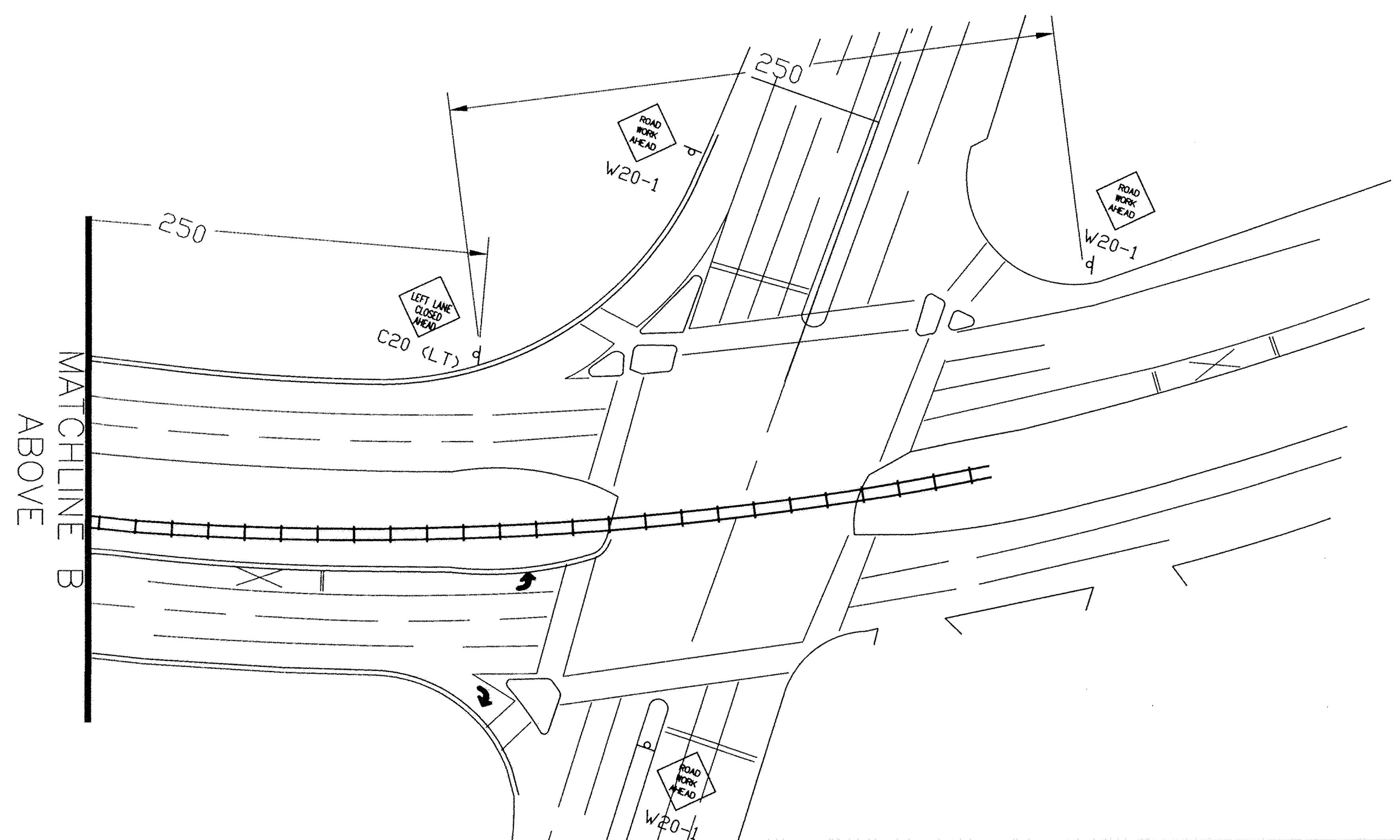
CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN:
DESIGNED:
PROJECT ENGINEER:
PROJECT MANAGER: BETH OVERSTREET

APPROVED: 7/31/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN
SHEET 3 OF 18
PLAN NO. ST-1049
SHEET No. S1.2





WESTERN AVENUE

LEGEND	
(sign symbol)	SIGN (AS NOTED ON PLAN)
•	39" DELINEATOR OR 28" CONE WITH REFLECTIVE BAND
⇦	DIRECTION OF TRAVEL
(arrow board symbol)	FLASHING ARROW BOARD (FAS) SIGN
[12']	CONSTRUCTION LANE DIMENSION
12'	EXISTING LANE DIMENSIONS
(hatched box)	WORK AREA

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NOTE:
LANE CLOSURES HEREIN SHOW THE INSIDE LANE ADJACENT TO THE RAILROAD EASEMENT CLOSED. CONTRACTOR MAY SUBMIT ADDITIONAL TRAFFIC PLANS PER MUTCD 2012 TO CLOSE OUTSIDE LANES IF REQUIRED TO EXECUTE THE WORK

N

GRAPHIC SCALE
50' 0 25' 50' 100'
(IN FEET)
1 INCH = 50 FT.

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - TRAFFIC CONTROL

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. KRAKOWER No. 2443 EXP. 3-31-13 STRUCTURAL STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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REGISTERED PROFESSIONAL ENGINEER TOUFIC J. SEMAAN No. C59226 Exp. 6/30/13 CIVIL STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

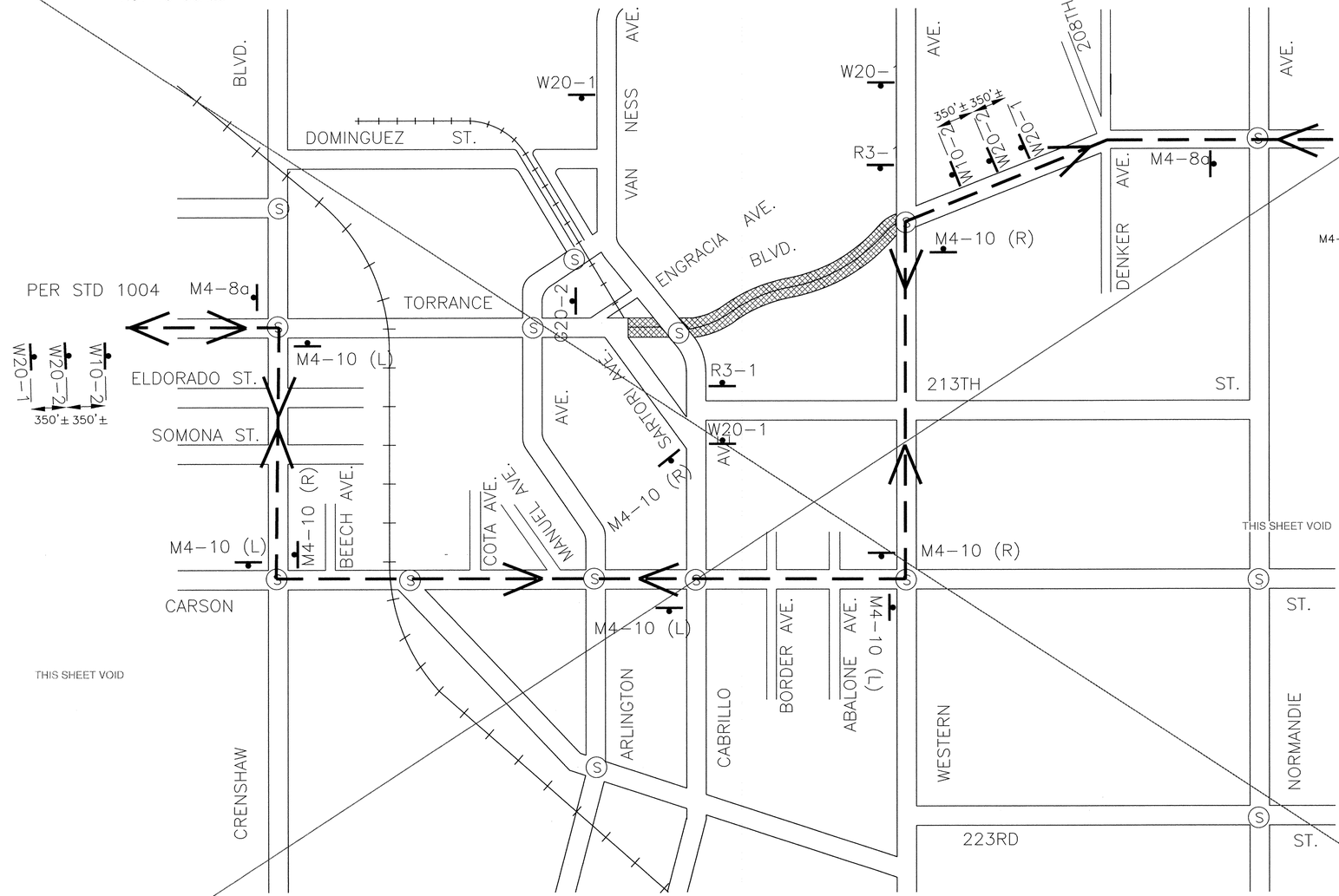
DRAWN:
DESIGNED:
PROJECT ENGINEER:
PROJECT MANAGER: BETH OVERSTREET

APPROVED:
7/31/12
TOUFIC J. SEMAAN DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 4 OF 18
PLAN NO. **ST-1049** | SHEET No. **S1.3**

ALTERNATE ROUTE

NOT TO SCALE



THIS SHEET VOID

THIS SHEET VOID

THIS SHEET VOID

THIS SHEET VOID

THIS SHEET VOID

SIGNS:

W20-2	: DETOUR AHEAD (48"X48")
R11-2	: ROAD CLOSED
C3A	: ROAD CLOSED TO THRU TRAFFIC (48"X24")
M4-10 (RT/LT)	: DETOUR ARROW (LEFT/RIGHT/VERTICAL) (48"X18")
M4-8a	: END DETOUR (48"X48")
G20-2	: END ROAD WORK
C17	: ROAD WORK 25 MPH SPEED LIMIT (24"X24")
W20-1	: ROAD WORK AHEAD (48"X48")
R11-2	: ROAD CLOSED
R1-1	: STOP SIGN (30"X30")
R4-7a	: KEEP RIGHT
R11	: DO NOT ENTER
R3-1	: NO RIGHT TURN (24"X24")
R3-2	: NO LEFT TURN (24"X24")

1. CONTRACTOR SHALL COVER OR REMOVE ANY EXISTING SIGNS OR TRAFFIC MARKINGS WHICH CONFLICT WITH THE DETOUR PLAN. CONTRACTOR SHALL BE RESPONSIBLE TO IMMEDIATELY RESTORE ANY SUCH SIGNS OR MARKINGS UPON REMOVAL OF THE DETOUR.
2. ALL C5 SIGNS (DETOUR ARROW) SHALL BE PLACED ON LIGHT POSTS OR SIGNAL POSTS OR ON A 4"X4" POST.
3. THIS PLAN SHOWS DETOUR ROUTE FOR BOTH EASTBOUND AND WESTBOUND DIRECTIONS. ONLY THE DETOUR ROUTE APPLICABLE AT THE TIME OF CONSTRUCTION SHALL BE MAINTAINED. ALL SIGNS AND DELINEATORS SHALL BE REMOVED IMMEDIATELY UPON RE-OPENING OF THE ROADWAY.

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REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - TRAFFIC CONTROL PLAN

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REV.	DATE	DESCRIPTION	BY	CHECKED

REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

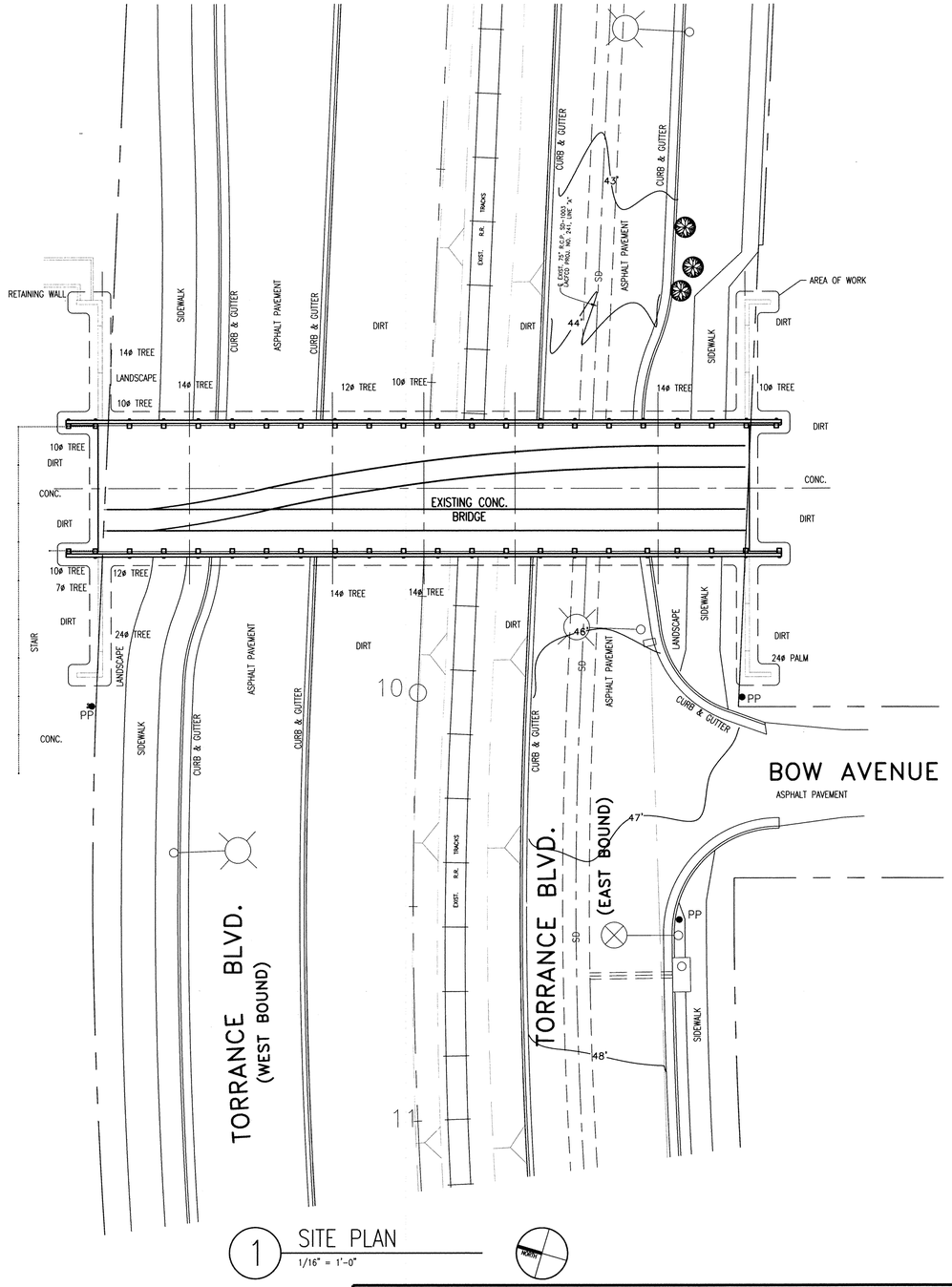
CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN:
DESIGNED:
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET

APPROVED:
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 5 OF 18

PLAN NO. ST-1049 | SHEET No. S1.4



1 SITE PLAN
1/16" = 1'-0"

ADDED

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - SITE PLAN

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REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

PROJECT ENGINEER: LEA REIS

PROJECT MANAGER: BETH OVERSTREET

APPROVED: 7/31/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 6 OF 18

PLAN NO. **ST-1049** | SHEET No. **S2.1**

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 Exp. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
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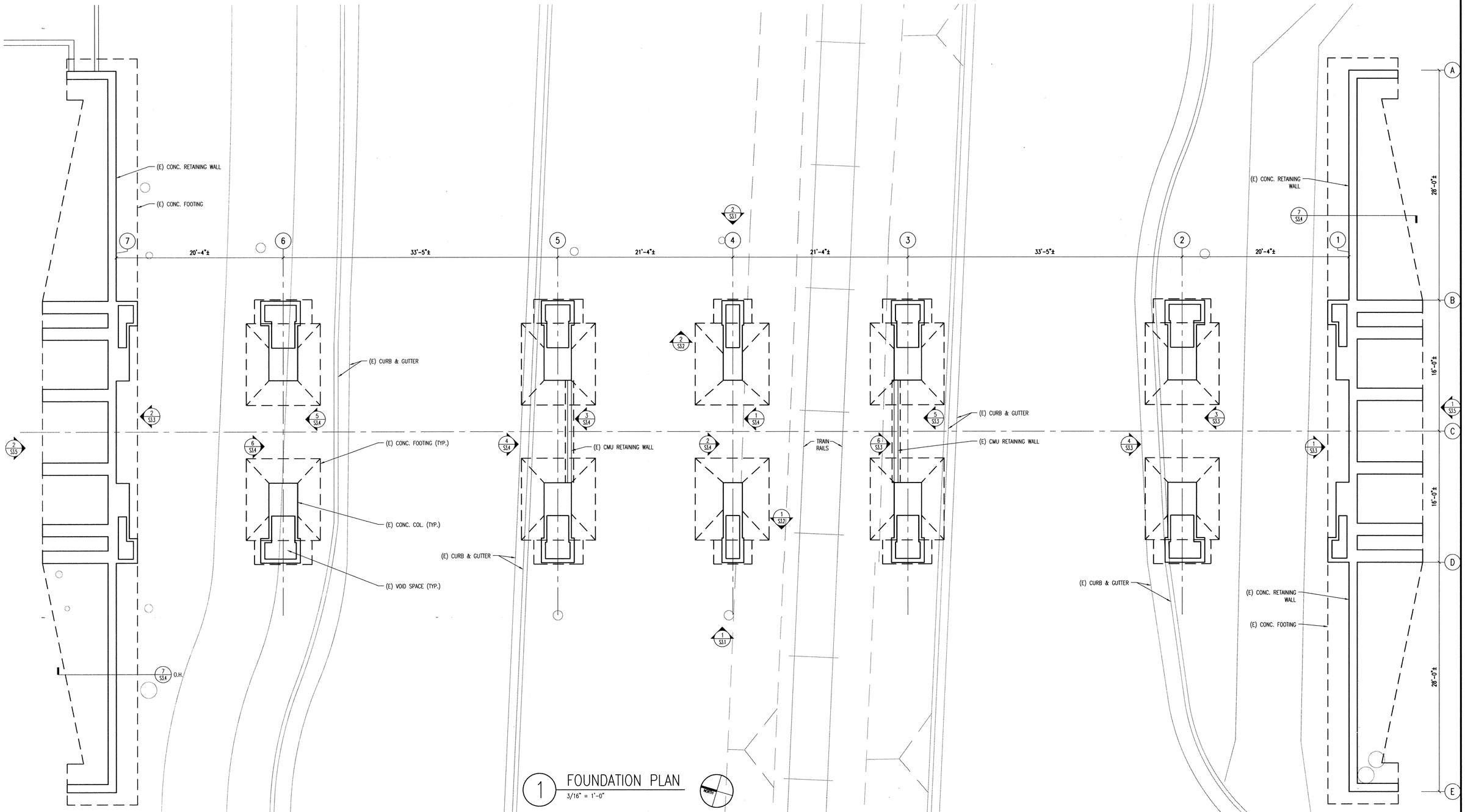

1 FOUNDATION PLAN
3/16" = 1'-0"

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - FOUNDATION PLAN

REGISTERED PROFESSIONAL ENGINEER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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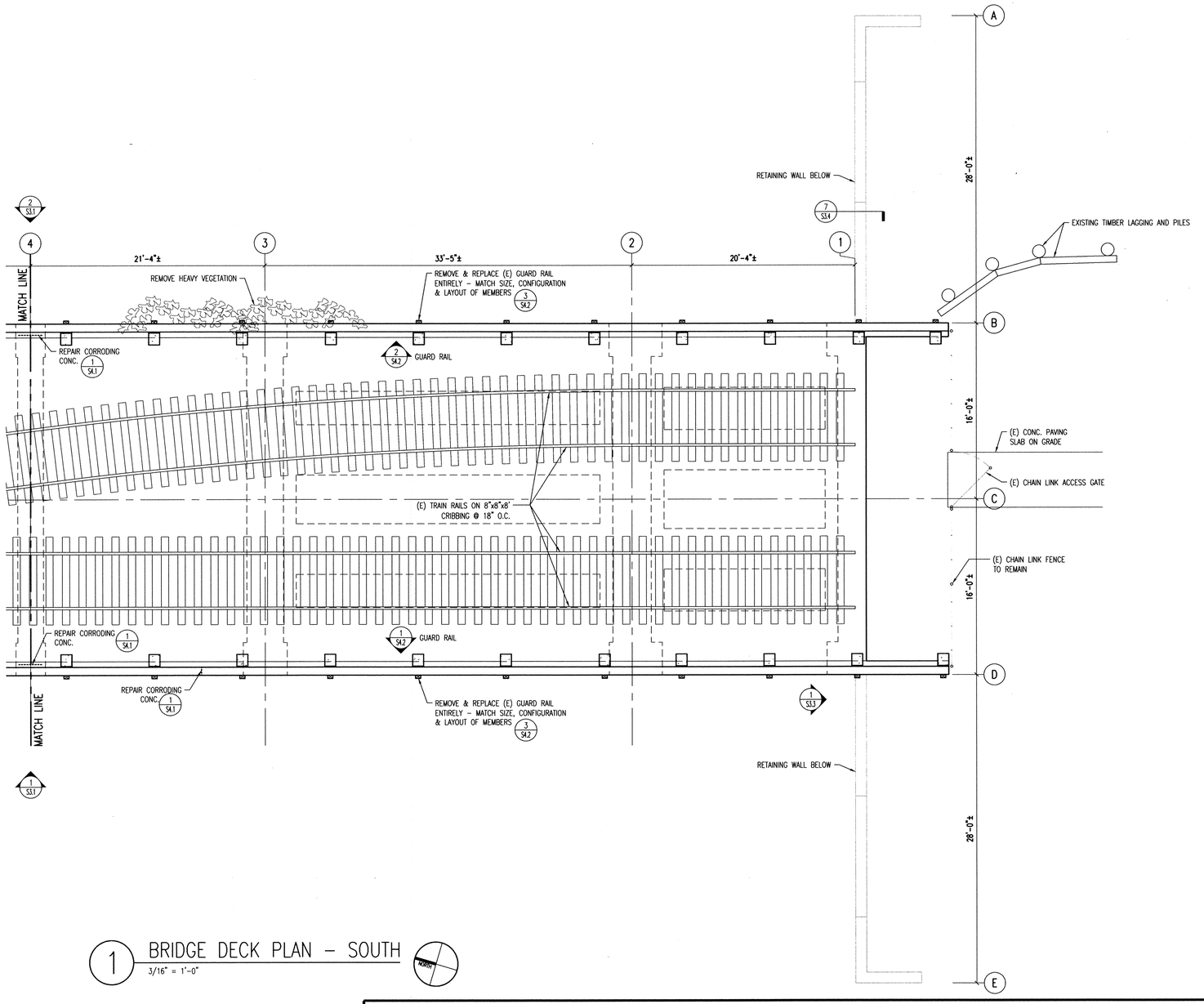
CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT
DESIGNED: Krakower and Associates
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET

APPROVED:
7/31/12
DATE
TOUFIC J. SEMAAN
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 7 OF 18
PLAN NO. ST-1049 | SHEET No. S2.2



NOTES:

1. ---------- DENOTES SURFACE CRACK
2. ▨ DENOTES AREA OF SPALL
3. ▭ DENOTES AREA OF SURFACE RUST STAIN
4. SEE (1/S4.1) FOR TYPICAL SPALL REPAIR DETAIL.
5. SEE (2/S4.1) FOR TYPICAL CRACK INJECTION DETAIL.
6. REMOVE ALL EXISTING VEGETATION AND REPAIR DISCOVERED SPALLS AND CRACKS PER NOTES 1 & 2.
7. AFTER ALL SPALL AND CRACK REPAIR IS COMPLETED, CLEAN ALL CONCRETE SURFACES IN ACCORDANCE WITH THE SPECIFICATIONS.
8. AFTER ALL SURFACES HAVE BEEN CLEANED, SEE SPECIFICATIONS FOR APPLICATION AND MAINTENANCE OF ANTI-GRAFFITI COATING.

1 BRIDGE DECK PLAN – SOUTH

3/16" = 1'-0"

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - BRIDGE DECK PLAN - SOUTH

REV.	DATE	DESCRIPTION	BY	CHECKED

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REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

michael krakower, se

KRAKOWER & ASSOCIATES
structural engineers

160 white oak drive
arcadia, ca
91006

626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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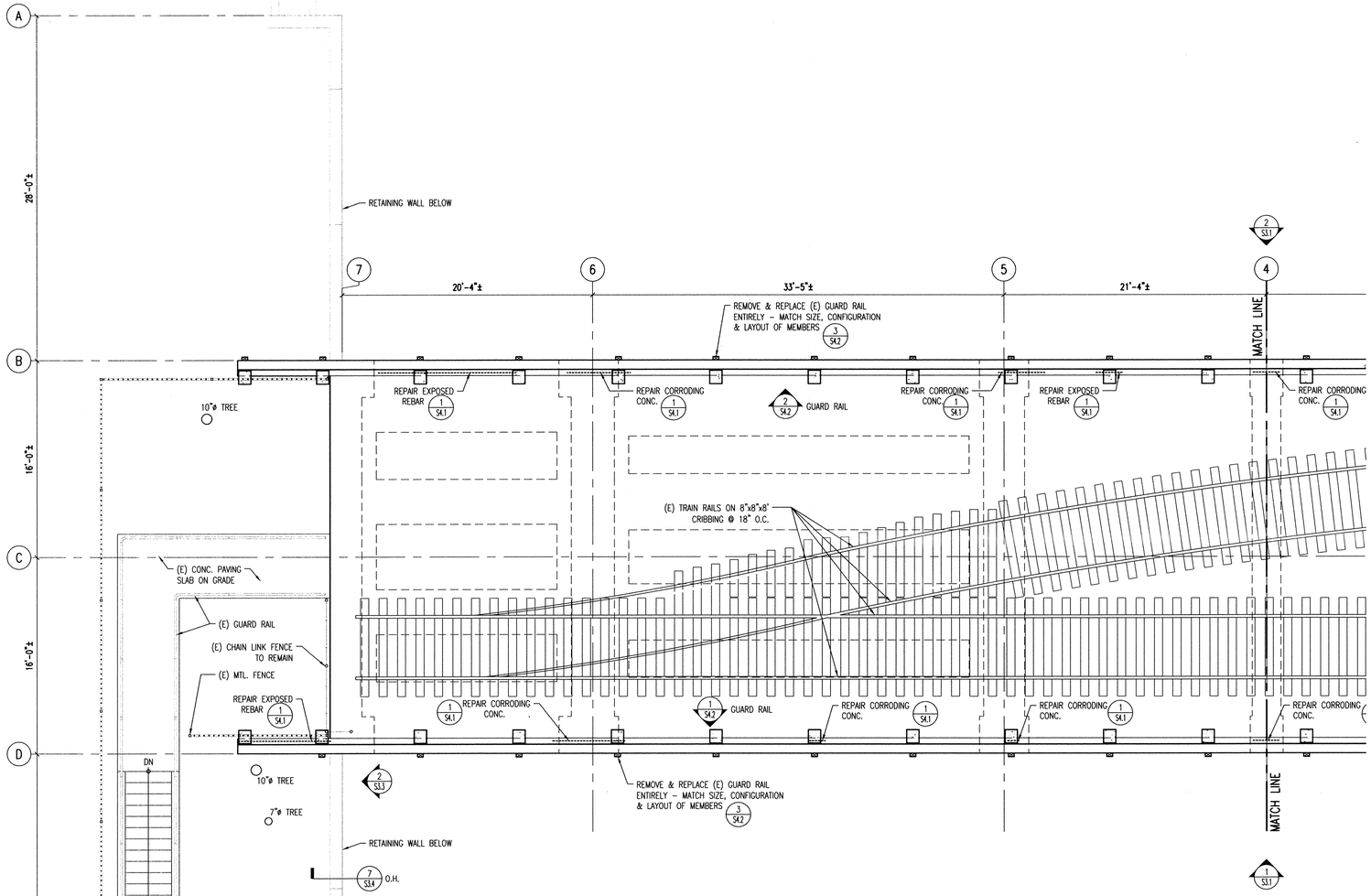
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET

APPROVED:
TOUFIC J. SEMAAN — DATE 7/31/12
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 8 OF 18

PLAN NO. ST-1049 | SHEET No. S2.3A



1 BRIDGE DECK PLAN - NORTH

3/16" = 1'-0"

NOTES:

1. ---------- DENOTES SURFACE CRACK
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THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - BRIDGE DECK PLAN - NORTH

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. KRAKOWER No. 2443 EXP. 3-31-13 STRUCTURAL STATE OF CALIFORNIA

michael krakower, se

KRAKOWER & ASSOCIATES
structurol engineers

160 white oak drive
arcadia, ca
91006

626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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REGISTERED PROFESSIONAL ENGINEER TOUFIC J. SEMAAN No. C59226 Exp. 6/30/13 CIVIL STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

APPROVED:

7/31/12

TOUFIC J. SEMAAN
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

DATE

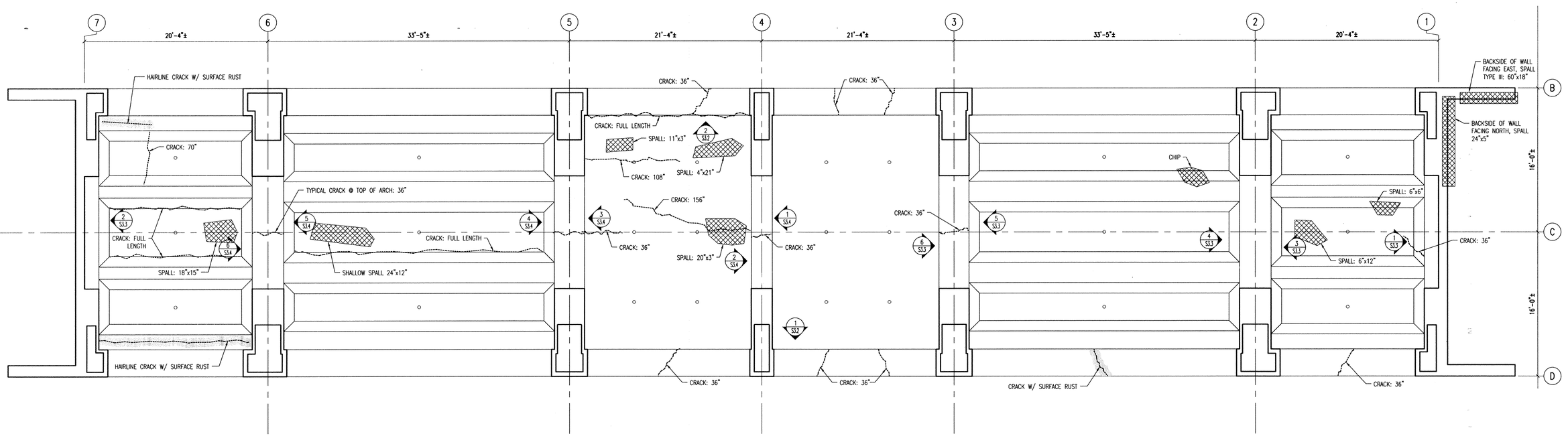
PROJECT ENGINEER: LEA REIS

PROJECT MANAGER: BETH OVERSTREET

SCALE: AS SHOWN | SHEET 9 OF 18

PLAN NO. ST-1049

SHEET No. S2.3B



1 REFLECTED CEILING PLAN

3/16" = 1'-0"

NOTES:

1. ---------- DENOTES SURFACE CRACK
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THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - REFLECTED CEILING PLAN

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se

KRAKOWER & ASSOCIATES
structural engineers

160 white oak drive
arcadia, ca
91006

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CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

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PROJECT ENGINEER: LEA REIS

PROJECT MANAGER: BETH OVERSTREET

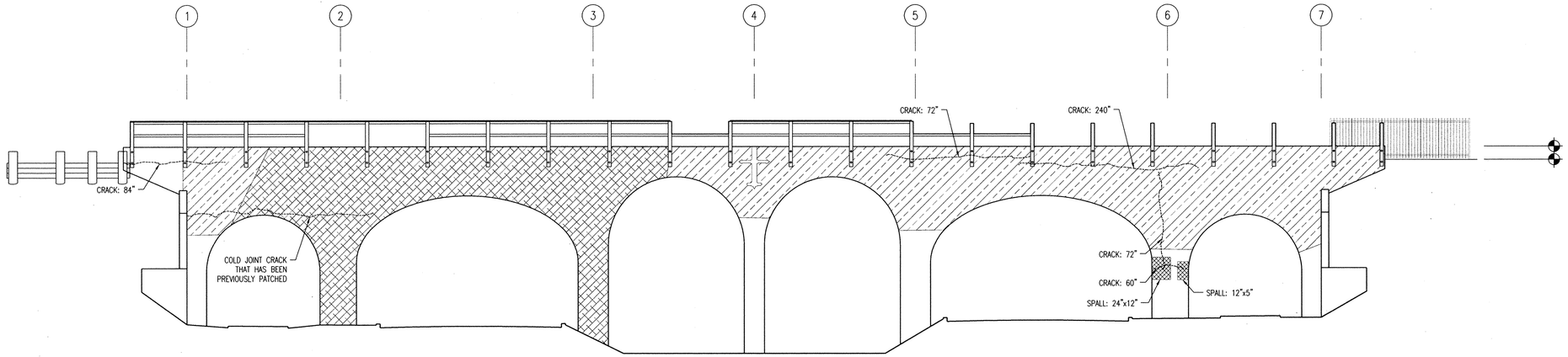
APPROVED:

7/31/12
DATE

TOUFIC J. SEMAAN
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

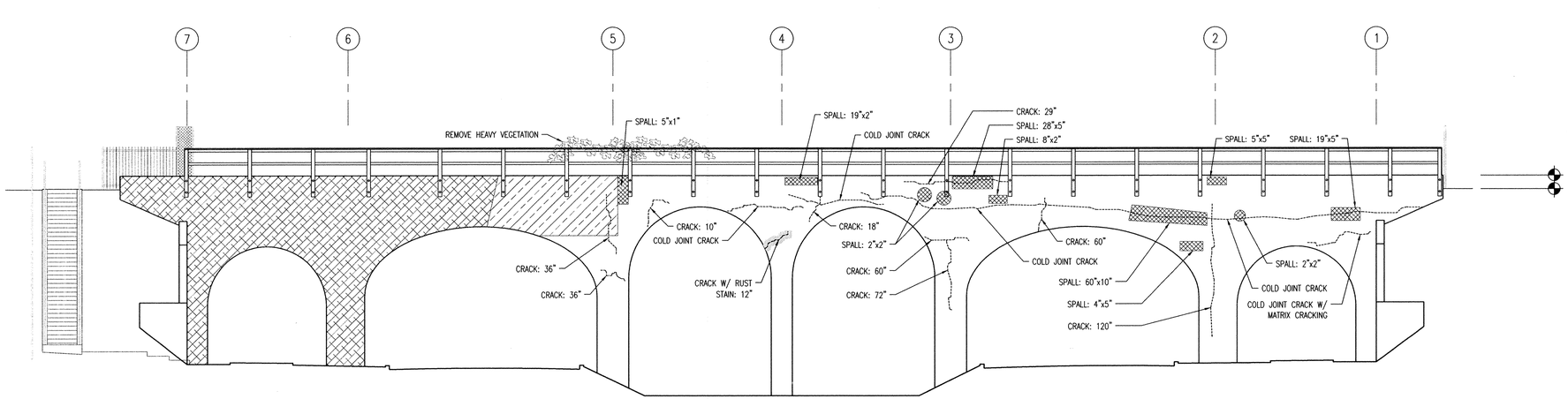
SCALE: AS SHOWN | SHEET 10 OF 18

PLAN NO. ST-1049 | SHEET No. S2.4



EAST ELEVATION

SCALE: 1/8" = 1'-0" | 2



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WEST ELEVATION

SCALE: 1/8" = 1'-0" | 1

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - ELEVATIONS

REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59225 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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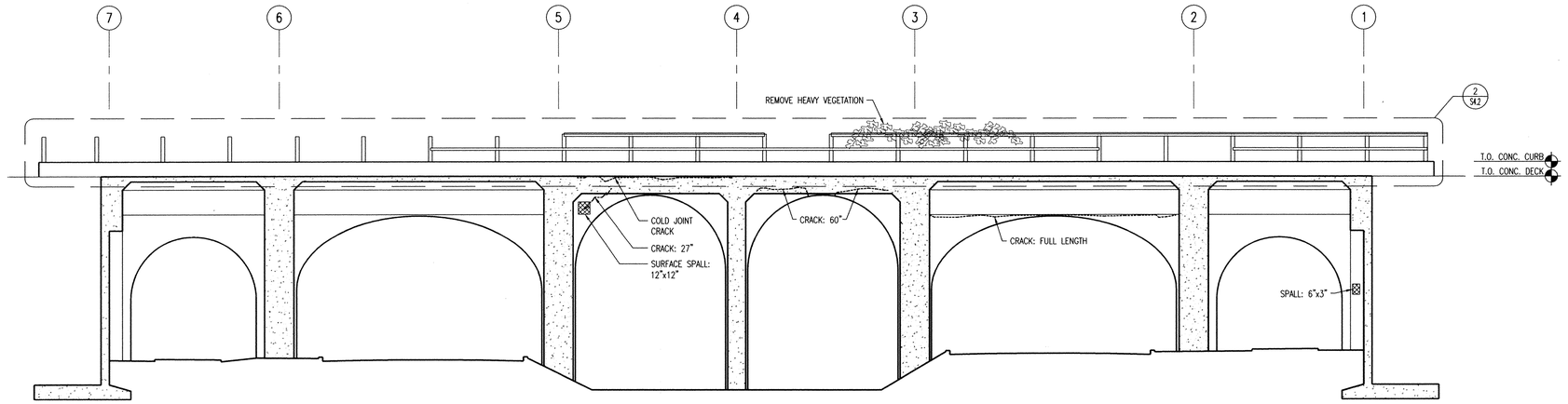
CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT
DESIGNED: Krakower and Associates
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET

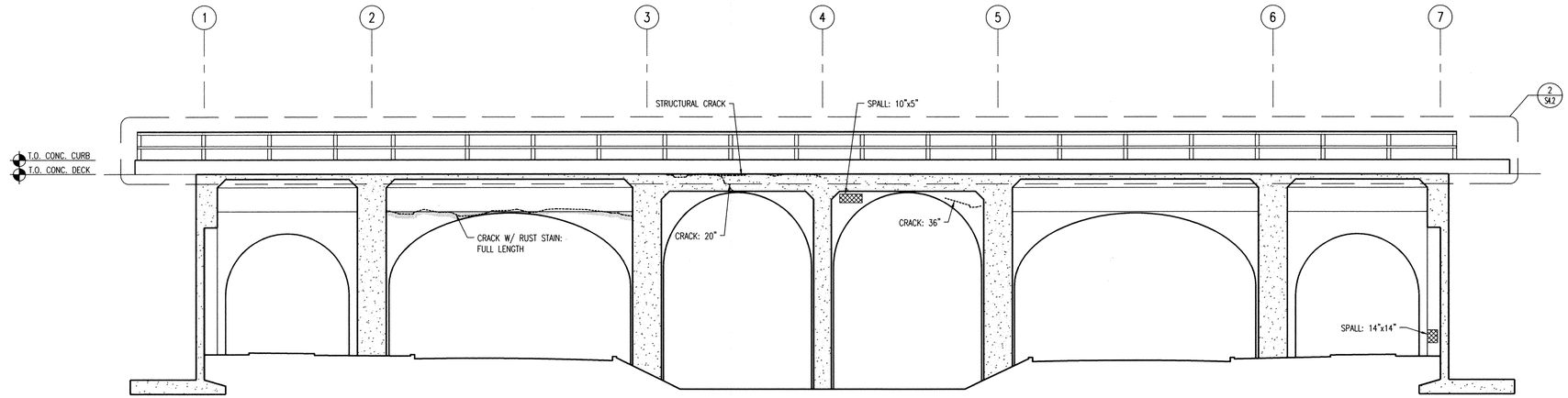
APPROVED:
7/31/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 11 OF 18
PLAN NO. ST-1049 | SHEET No. S3.1



EAST INTERIOR ELEVATION

SCALE: 1/8" = 1'-0" | 2



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WEST INTERIOR ELEVATION

SCALE: 1/8" = 1'-0" | 1

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - ELEVATIONS

REGISTERED PROFESSIONAL ENGINEER — STRUCTURAL — No. 2443 EXP. 3-31-13 — STATE OF CALIFORNIA

michael krakower, se

KRAKOWER & ASSOCIATES
structural engineers

160 white oak drive
arcadia, ca
91006

626 355-6088
fax 626 355-9394
e-mail: mkcose@verizon.net

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CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

PROJECT ENGINEER: LEA REIS

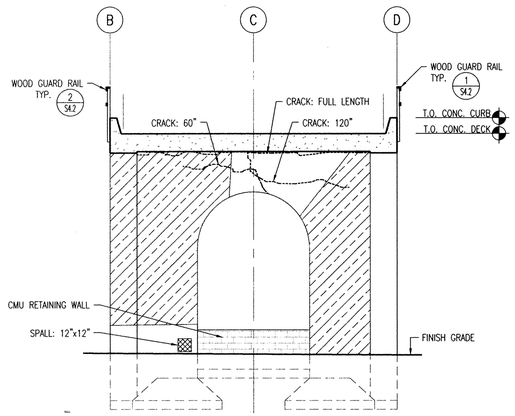
PROJECT MANAGER: BETH OVERSTREET

APPROVED:

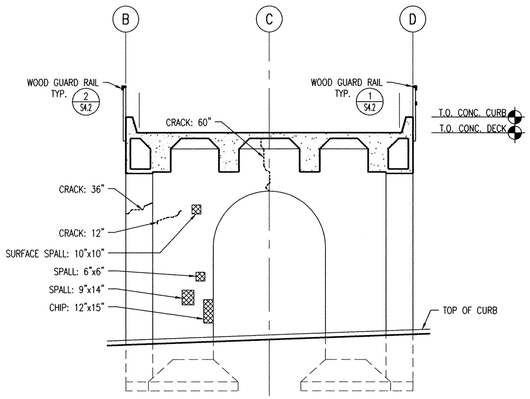
7/31/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 12 OF 18

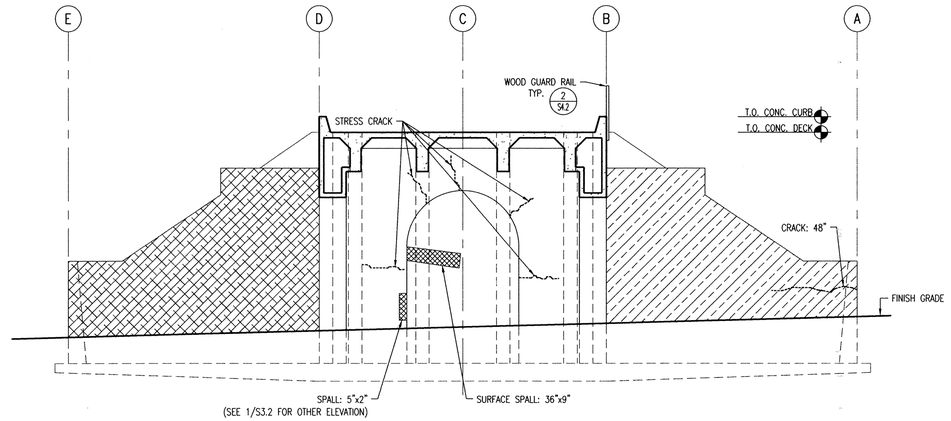
PLAN NO. ST-1049 | SHEET No. S3.2



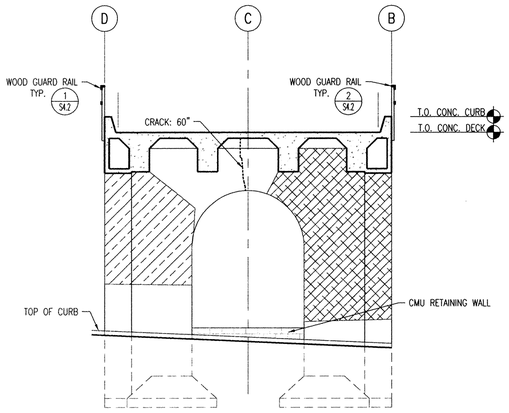
SOUTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 6



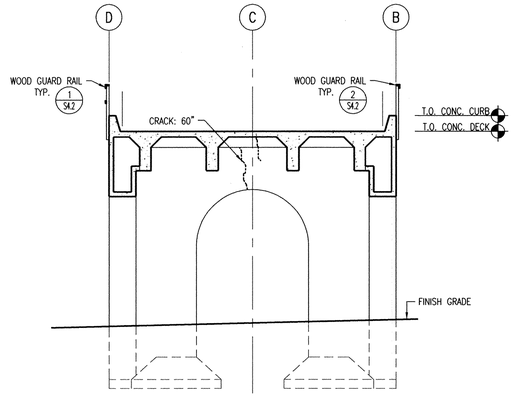
SOUTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 4



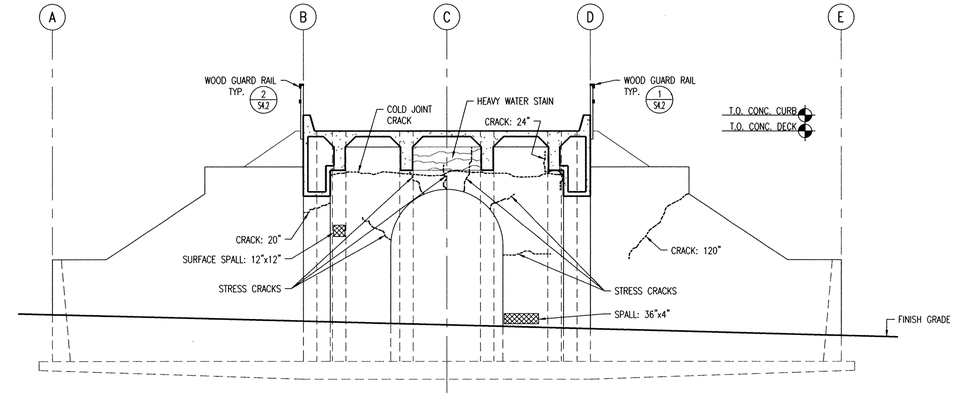
NORTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 2



NORTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 5



NORTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 3



NOTES:

1. ---------- DENOTES SURFACE CRACK
2. ▨ DENOTES AREA OF SPALL
3. ▭ DENOTES AREA OF SURFACE RUST STAIN
4. ▨ DENOTES AREA OF LIMITED VISIBILITY DUE TO VEGETATION
5. ▨ DENOTES AREA OF NO VISIBILITY DUE TO VEGETATION
6. ▭ DENOTES AREA OF HEAVY WATER STAIN
7. SEE (1/S4.1) FOR TYPICAL SPALL REPAIR DETAIL.
8. SEE (2/S4.1) FOR TYPICAL CRACK INJECTION DETAIL.
9. REMOVE ALL EXISTING VEGETATION AND REPAIR DISCOVERED SPALLS AND CRACKS PER NOTES 1 & 2.
10. AFTER ALL SPALL AND CRACK REPAIR IS COMPLETED, CLEAN ALL CONCRETE SURFACES IN ACCORDANCE WITH THE SPECIFICATIONS.
11. AFTER ALL SURFACES HAVE BEEN CLEANED, SEE SPECIFICATIONS FOR APPLICATION AND MAINTENANCE OF ANTI-GRAFFITI COATING.

SOUTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 1

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - ELEVATIONS

REGISTERED PROFESSIONAL ENGINEER — MICHAEL A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcose@verizon.net

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REV.	DATE	DESCRIPTION	BY	CHECKED

REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

PROJECT ENGINEER: LEA REIS

PROJECT MANAGER: BETH OVERSTREET

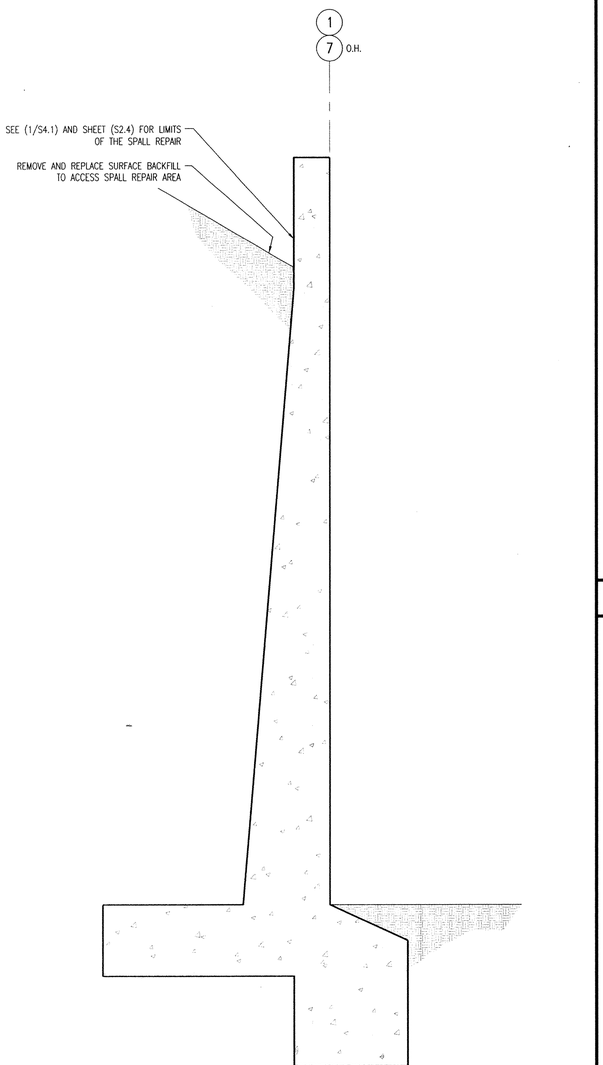
APPROVED:

7/31/12

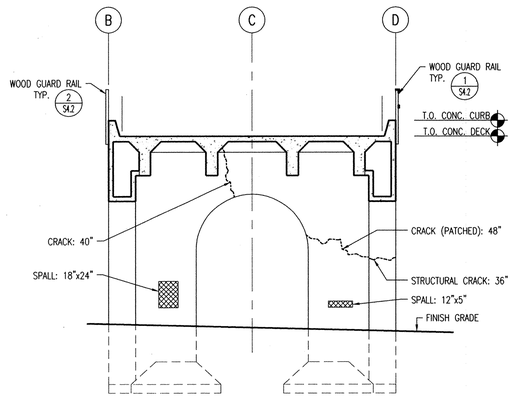
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 13 OF 18

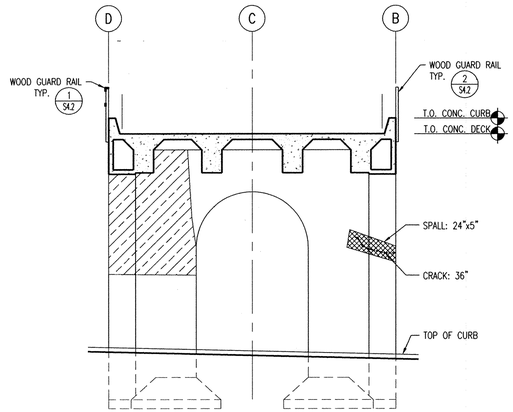
PLAN NO. ST-1049 | SHEET No. S3.3



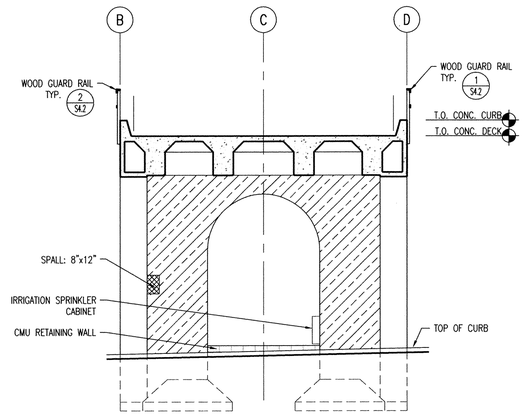
RETAINING WALL SECTION SCALE: 1/2" = 1'-0" | 7



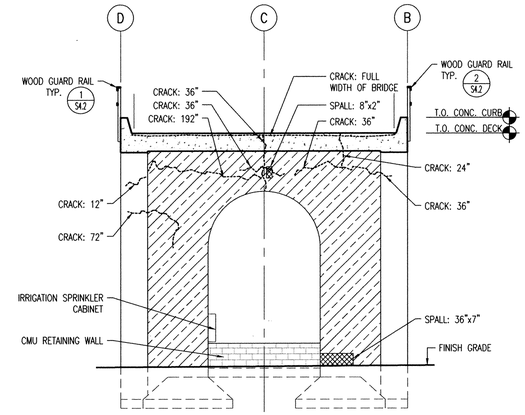
SOUTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 6



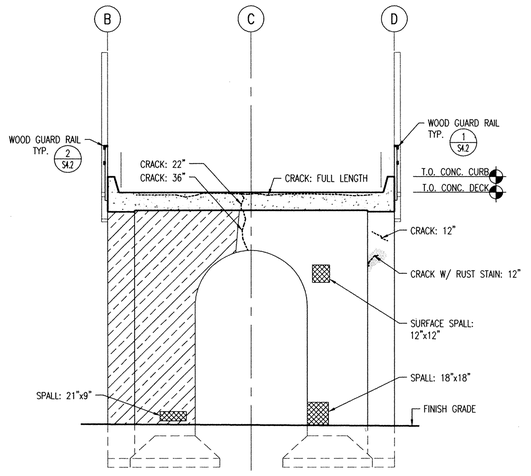
NORTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 5



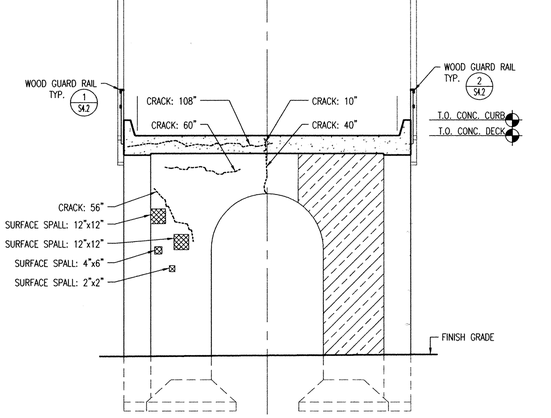
SOUTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 4



NORTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 3



SOUTH INTERIOR ELEVATION SCALE: 1/8" = 1'-0" | 2



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REGISTERED PROFESSIONAL ENGINEER — KENNETH A. KRAKOWER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcosse@verizon.net

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - ELEVATIONS

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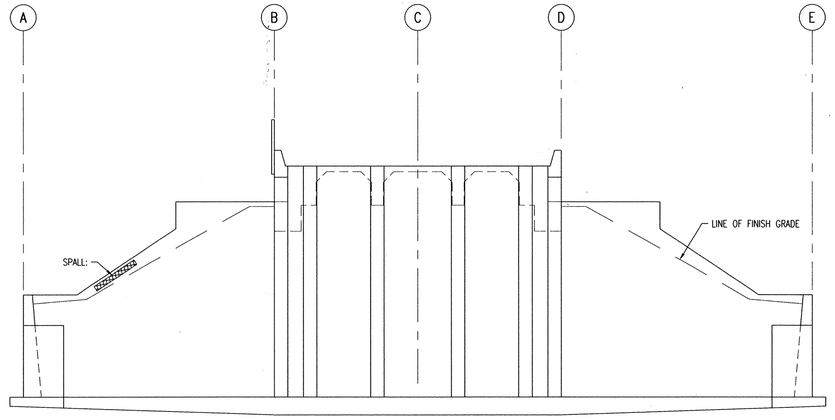
REV.	DATE	DESCRIPTION	BY	CHECKED

REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — CIVIL — STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

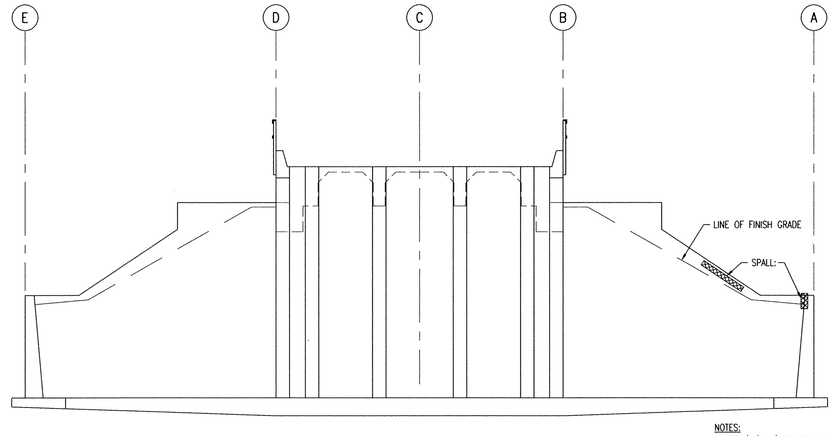
DRAWN: B. PROFFITT
APPROVED: 7/31/12
DESIGNED: Krakower and Associates
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET
SCALE: AS SHOWN | SHEET 14 OF 18
PLAN NO. ST-1049 | SHEET No. S3.4



BACK SIDE OF NORTH RETAINING WALL

SCALE: 1/8" = 1'-0"

2



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BACK SIDE OF SOUTH RETAINING WALL

SCALE: 1/8" = 1'-0"

1

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - ELEVATIONS

REGISTERED PROFESSIONAL ENGINEER
No. 2443
EXP. 3-31-13
STRUCTURAL
STATE OF CALIFORNIA

michael krakower, se
KRAKOWER & ASSOCIATES
structural engineers
160 white oak drive
arcadia, ca
91006
626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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CIVIL
STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

APPROVED:

TOUFIC J. SEMAAN — DATE 7/31/12
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

PROJECT ENGINEER: LEA REIS

PROJECT MANAGER: BETH OVERSTREET

SCALE: AS SHOWN | SHEET 15 OF 18

PLAN NO. **ST-1049** | SHEET No. **S3.5**

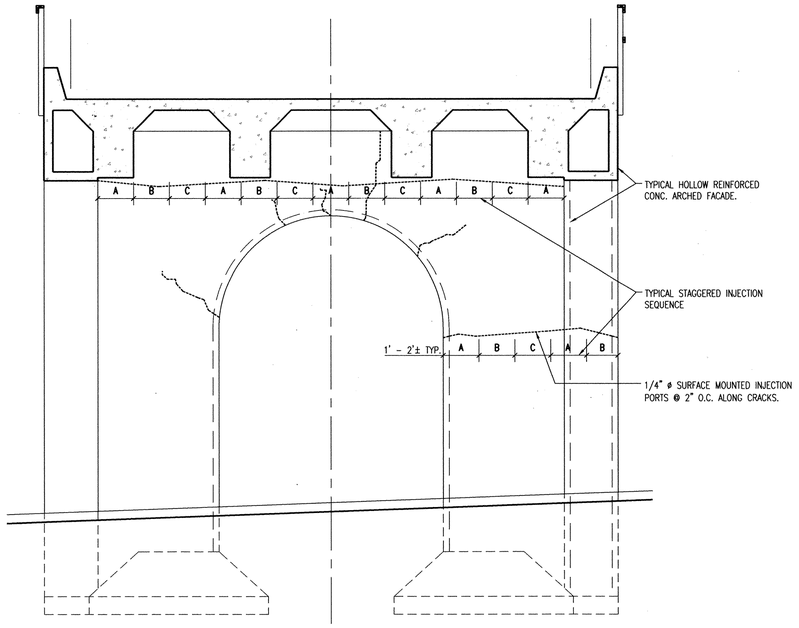
GENERAL INJECTION PROCEDURE:

1. FOR CRACK INJECTION IN HORIZONTAL OR OVERHEAD ORIENTATION, INJECTION SHALL BEGIN AT PORTS LOCATED AT WIDEST PART OF THE CRACK AND CONTINUE TO NARROWEST PART OF THE CRACK.

2. VERTICAL AND DIAGONAL CRACK SHALL START AT LOWEST SECTION AND PROCEED UPWARDS.

3. ACCESS TO BOTH SIDES OF A CRACK, IN GENERAL, IS NOT AVAILABLE. CLEAN CRACKS THOROUGHLY WITH COMPRESSED AIR AND VACUUM CLEAN. INJECTION PORTS SHALL BE 2 INCHES ON CENTER. INJECT GROUT IN A,B,C, STAGGERED SEQUENCE. INJECT ALL A's IN 1' – 2' LENGTHS. CAP AND LET SET 45 – 60 MINUTES. INJECT ALL B's & C's IN THE SAME MANNER. ALTERNATIVE INJECTION MEANS AND METHODS THAT MINIMIZE LOSS OF GROUT INTO VOIDS OF HOLLOW ARCHES MAY BE SUBMITTED.

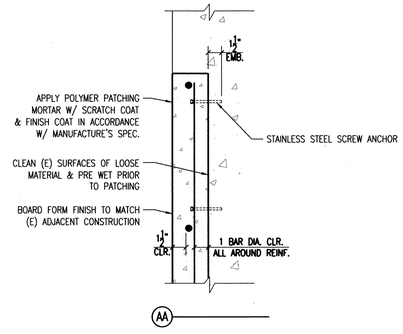
4. SEE WALL ELEVATIONS, GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL CRACK REPAIR CRITERIA



TYPICAL CRACKED SURFACE ELEVATION

TYPICAL CRACK REPAIR BY BLIND GROUT INJECTION

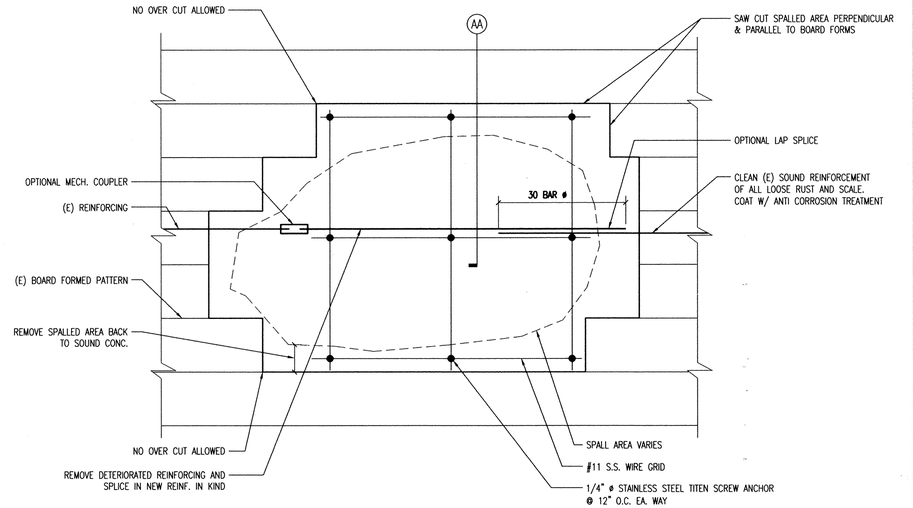
SCALE: 3/8" = 1'-0" | 2



NOTES:

1. STAINLESS STEEL WIRE AND PINS NOT REQUIRED FOR SPALL REPAIR AREA LESS THAN 2 SQUARE FEET.

2. SEE WALL ELEVATIONS, GENERAL NOTES & SPECIFICATIONS FOR ADDITIONAL SPALL REPAIR CRITERIA.



TYPICAL SPALL REPAIR

SCALE: 1/4" = 1'-0" | 1

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - SPALL REPAIR & CRACK INJECTION

REGISTERED PROFESSIONAL ENGINEER — No. 2443 EXP. 3-31-13 — STRUCTURAL — STATE OF CALIFORNIA

michael krakower, se

KRAKOWER & ASSOCIATES
structural engineers

160 white oak drive
arcadia, ca
91006

626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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REV.	DATE	DESCRIPTION	BY	CHECKED

REGISTERED PROFESSIONAL ENGINEER — TOUFIC J. SEMAAN — No. C59226 Exp. 6/30/13 — Civil — STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

PROJECT ENGINEER: LEA REIS

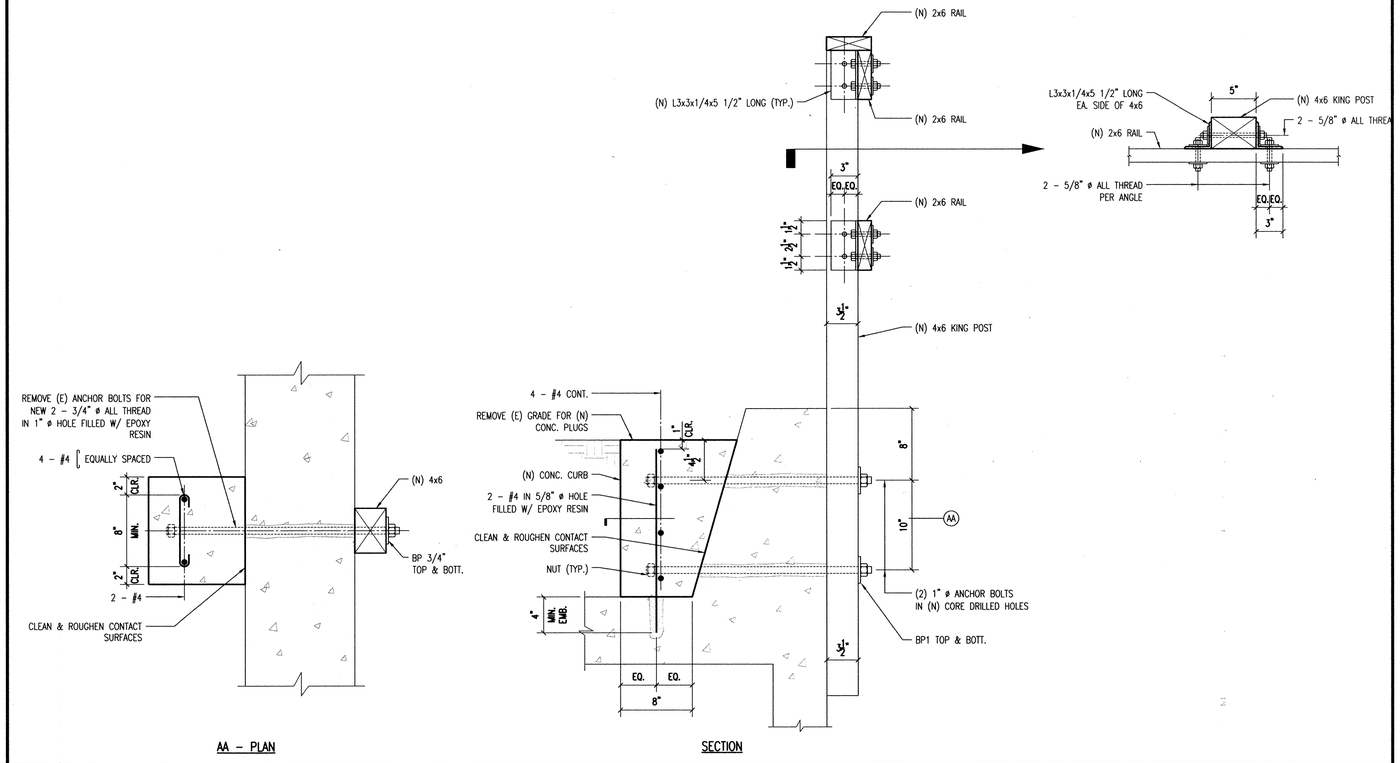
PROJECT MANAGER: BETH OVERSTREET

APPROVED:

7/31/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 16 OF 18

PLAN NO. **ST-1049** | SHEET No. **S4.1**



AA – PLAN

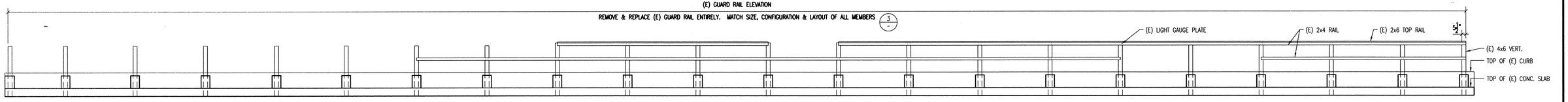
SECTION

NEW GUARD RAIL DETAIL

SCALE: 1 1/2" = 1'-0" | 3

(E) GUARD RAIL ELEVATION

REMOVE & REPLACE (E) GUARD RAIL ENTIRELY. MATCH SIZE, CONFIGURATION & LAYOUT OF ALL MEMBERS (3)

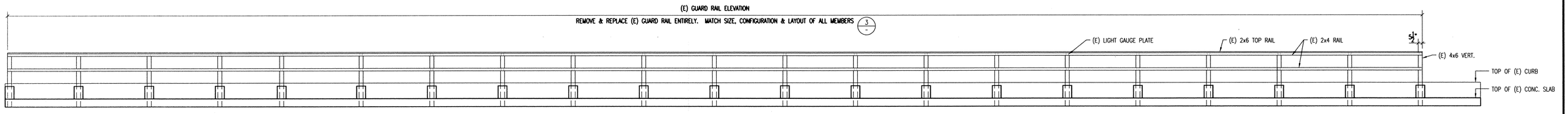


EXISTING EAST GUARD RAIL

SCALE: 3/16" = 1'-0" | 2

(E) GUARD RAIL ELEVATION

REMOVE & REPLACE (E) GUARD RAIL ENTIRELY. MATCH SIZE, CONFIGURATION & LAYOUT OF ALL MEMBERS (3)



EXISTING WEST GUARD RAIL

SCALE: 3/16" = 1'-0" | 1

THE PACIFIC ELECTRIC RAILROAD BRIDGE REHABILITATION AND BEAUTIFICATION - GUARD RAILING

REGISTERED PROFESSIONAL ENGINEER MICHAEL A. KRAKOWER No. 2443 EXP. 3-31-13 STRUCTURAL STATE OF CALIFORNIA

michael krakower, se

KRAKOWER & ASSOCIATES
structurol engineers

160 white oak drive
arcadia, ca
91006

626 355-6088
fax 626 355-9394
e-mail: mkcase@verizon.net

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REGISTERED PROFESSIONAL ENGINEER TOUFIC J. SEMAAN No. C59226 Exp. 6/30/13 CIVIL STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: B. PROFFITT

DESIGNED: Krakower and Associates

PROJECT ENGINEER: LEA REIS

PROJECT MANAGER: BETH OVERSTREET

APPROVED: 7/31/12
TOUFIC J. SEMAAN — DATE
CITY ENGINEER
R.C.E. NO. C59226
EXP. 6/30/13

SCALE: AS SHOWN | SHEET 17 OF 18

PLAN NO. ST-1049 | SHEET No. S4.2

GENERAL NOTES

1. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO ACHIEVE A COMPLETE AND OPERATING SYSTEM.

2. COORDINATE AND OBTAIN APPROVALS FROM ALL RESPECTIVE UTILITY COMPANIES AS REQUIRED FOR A COMPLETE AND OPERATING INSTALLATION.

3. INSTALL RACEWAY SYSTEMS AS FOLLOWS:

   A. USE ELECTRIC METALLIC TUBE CONDUIT IN ALL AREAS PROTECTED ABOVE CEILING OR IN WALLS.
   B. USE RIGID GALVANIZED STEEL IN ALL AREAS EXPOSED TO WEATHER OR PHYSICAL DAMAGE.
   C. USE FLEXIBLE METALLIC CONDUIT ONLY IN AREAS AS PERMITTED BY LOCAL CODE AUTHORITY. USE SEAL-TITE IN AREAS EXPOSED TO WEATHER.
   D. USE COMPRESSION TYPE FITTINGS FOR ELECTRICAL METALLIC TUBING WHERE UTILIZED.
   E. USE P.V.C. CONDUIT UNDERGROUND WITH CODE SIZED GROUND. CONDUIT RISERS AND STUBS ABOVE GRADE SHALL BE I.M.C. WITH HALF-LAPPED TAPE COVERING OR PVC COATING.
   F. THE USE OF ROMEX OR BX IS NOT PERMITTED.

4. ALL NEW WIRING SHALL BE COPPER TYPE "THHN/THWN" U.N.O.

5. ALL FIXTURE AND DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCH. DRAWINGS AS WELL AS EQUIPMENT SUPPLIER PRIOR TO ANY ROUGH-IN WORK.

6. ALL LIGHTING FIXTURES SHALL BE MOUNTED AND SUPPORTED IN ACCORDANCE WITH OSHA STANDARDS AND ALL NATIONAL AND LOCAL ELECTRICAL CODES.

7. THESE DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE INTENT OF EQUIPMENT, DEVICES, ETC., TO BE CONNECTED AND THE CIRCUIT TO WHICH THEY ARE TO BE CONNECTED. CONTRACTOR SHALL INSTALL ALL CONDUIT, JUNCTION BOXES, ETC AS REQUIRED FOR A COMPLETE, OPERATIONAL AND CODE-COMPLIANT SYSTEM.

8. ALL EXTERIOR EQUIPMENT SHALL BE WEATHERPROOF.

9. ALL EQUIPMENT TO BE NEW AND BEAR A "UL" LABEL, U.N.O.

10. ELECTRICAL CONTRACTOR TO VISIT SITE PRIOR TO BID DATE TO VERIFY ALL EXISTING CONDITIONS TO BE ENCOUNTERED IN THE INSTALLATION OF ALL NEW EQUIPMENT, FIXTURES, DEVICES, FEEDERS, ETC. EXACT INSTALLATION METHOD AND REQUIREMENTS SHALL BE VERIFIRED AND DETERMINED PRIOR TO BID DATE. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY REUQIRED MODIFICATIONS WHICH ARE NOT SHOWN ON THESE DRAWINGS. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED.

11. ALL EQUIPMENT ELECTRICAL CHARACTERISTICS, NEMA CONFIGURATION LOCATIONS, AND CONNECTION REQUIREMENTS SHALL BE VERIFIED PRIOR TO ANY ROUGH-IN WORK.

12. ELECTRICAL CONTRACTOR SHALL FURNISH THE FOLLOWING SHOP DRAWINGS FOR PRIOR APPROVAL:
   A. ALL SUBSTITUTED LIGHT FIXTURES.
   B. ALL ELECTRICAL SERIVCE EQUIPMENT, DISTRIBUTION EQUIPMENT AND PANELBOARDS.
   C. ALL OTHER ITEMS SPECIFICALLY INDICATED.

13. COMPLETE ELECTRICAL SYSTEM SHALL BE GROUNDED IN ACCORDANCE WITH THE PRESENTLY ADOPTED EDITION OF THE NEC ART. 250.

14. PROVIDE RIVETED ON ENGRAVED PLASTIC NAMEPLATES (BLACK WITH WHITE LETTERS) FOR ALL MAJOR ELECTRICAL EQUIPMENT.

15. PROVIDE OWNER WITH ONE SET OF ELECTRICAL "AS-BUILTS" AT THE COMPLETION OF JOB.

16. ALL DEVICES MOUNTED BACK-TO-BACK ON ANY FIRE-RATED WALL SHALL BE MOUNTED WITH 24" MINIMUM HORIZONTAL OFFSET.

17. THE EXISTING CONDITIONS SHOWN ARE FROM AVAILABLE RECORD DRAWINGS AND SHOWN FOR REFERNCE ONLY. CONTRACTOR SHALL VERIFY ACTuAL EXISTING CONDITIONS AT SITE PRIOR TO SUBMITTING BID. ALL DEMOLITION, ALTERATION, EXTENSION, RELOCATION, REHABILITATION WORK SHALL BE INCLUDED IN CONTRACT.

18. PANELBOARDS SHALL BE PROVIDED WITH TYPEWRITTEN PANEL SCHEDULE MOUNTED INSIDE EACH PANEL AND ENGRAVED PRIMARY/SECONDARY PANEL LABELS FROM SWITCHBOARD.

19. VERIFY ALL DISCONNECT SWITCHES, FUSE SIZES AND TYPES WITH MECHANICAL MANUFACTURER PRIOR TO INSTALLATION.

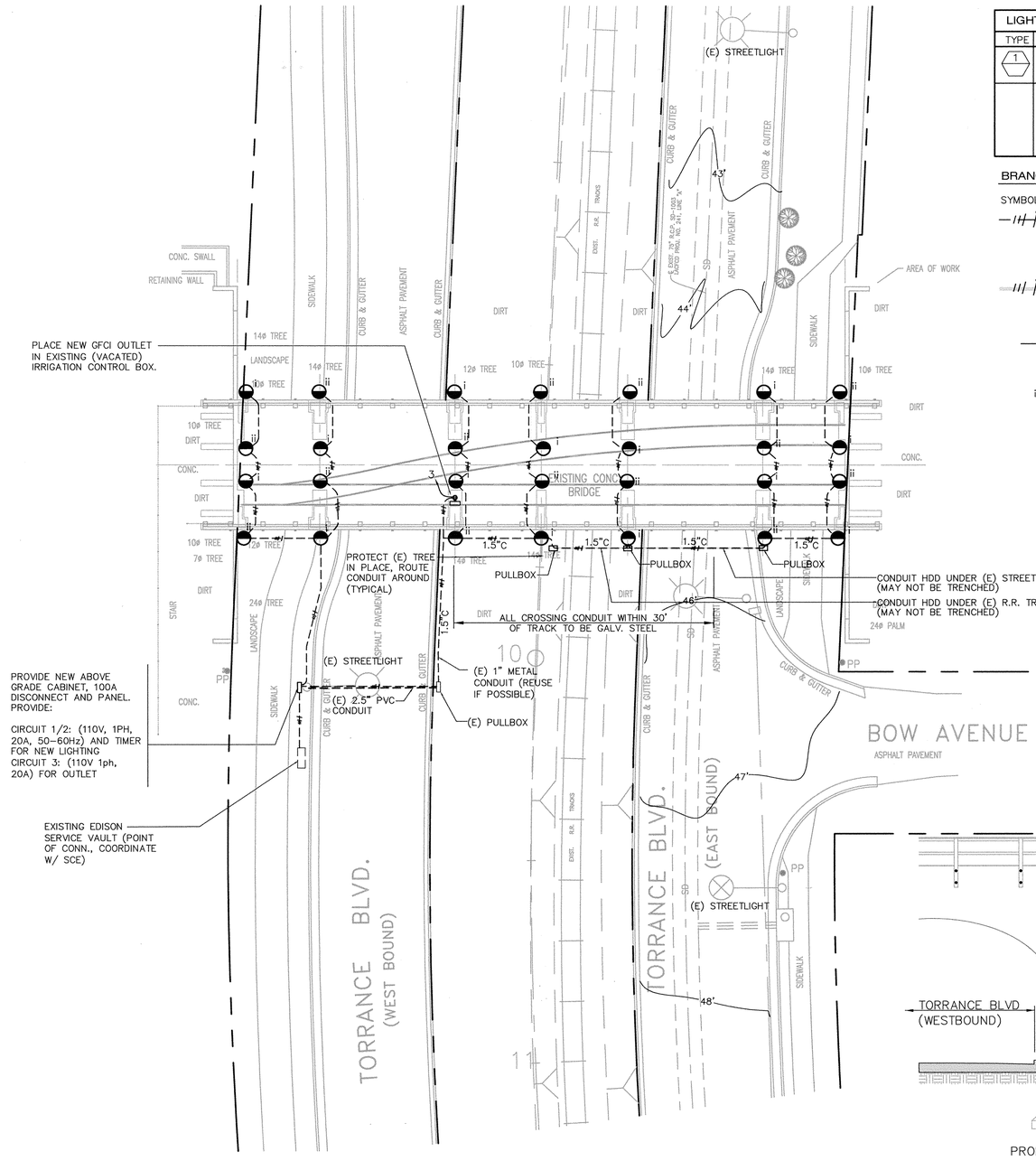
20. A SEPARATE GROUNDING CONDUCTOR SHALL BE RUN IN ALL NON-METALLIC CONDUIT RUNS.

21. ALL ELECTRICAL DEVICES SHOWN SHADED ARE EXISTING TO REMAIN. DEVICES SHOWN WITH SOLID LINEWORK ARE NEW.

22. ALL PROPOSED UNDERGROUND CONDUIT SHALL BE INSTALLED WITH MINIMUM COVERS AS FOLLOWS:
   - 24" COVER FOR SECONDARY RUNS
   - 30" COVER FOR PRIMARY RUNS
   - 12" COVER FROM SUBGRADE IN TRAFFIC AREAS, BUT NOT LESS THAN 24" COVER FROM FINISH SURFACE.
   - 30" COVER FROM GUTTER FLOW LINES

   WHERE A LOCAL AGENCY OR SO. CAL. EDISON REQUIRES GREATER COVER, THOSE REQUIREMENTS SHALL CONTROL. CALTRANS AND AREMA REQUIREMENTS SHALL GOVERN FOR CONDUIT PLACED UNDER TORRANCE BLVD. AND RAILROAD, RESPECTIVELY.

23. CROSSING OF UNION PACIFIC TRACK REQUIRES AN APPLICATION BE FILED WITH UNION PACIFIC RAILROAD COMPANY; PLEASE SEE APPLICATION IN APPENDIX OF THE SPECIFICATIONS FOR THIS PROJECT.



SITE LIGHTING AND POWER PLAN

SCALE: 1/16"=1'-0"

LIGHTING FIXTURE SCHEDULE								
TYPE	IMAGE	MANUF. CAT. #	LAMP	WATT	QTY.	VOLT		REMARKS
1		PHILIPS HADCO 125SSNFCL57	LED	17	i: 14 ii: 14	120 120		IN GROUND MOUNTED CONFIRM LIGHT AIMING WITH ARCHITECT
				TOT. LOAD: 28		x 17/110 = 4.3A		

BRANCH CIRCUIT

SYMBOL	DESCRIPTION
—/#/7—	SECONDARY 1.5" CONDUIT (PE UNLESS NOTED OTHERWISE) ROUTED BELOW FINISH GRADE. INCLUDE CODE-SIZED COPPER BOND CONDUCTOR (NOT SHOWN ON PLAN) IN ALL NON-METALLIC CONDUIT RUNS. SIZE AS SHOWN
/// / 7	SECONDARY 1.5" PE/PVC COATED HOT DIP GALVANIZED RIGID STEEL CONDUIT CONDUIT HORIZONTALLY DIRECTIONALLY DRILLED (HDD) BELOW EXISTING STREET/TRACKS.
→	HOMERUN TO DESTINATION AS INDICATED. REFER TO CONDUIT SYMBOL ABOVE. ALL LIGHTING HOMERUN TO CIRCUITS 1/2 U.N.O.
i, ii	CIRCUIT INDICATOR

7 DENOTES #12 THHN/THWN EQUIPMENT GROUND WIRE

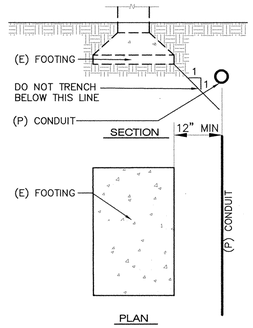
/ DENOTES #12 THHN/THWN ISOLATED GROUND WIRE

ALL HOMERUNS AND BRANCH CIRCUITS SHALL HAVE GROUND WIRE

CROSS LINE DENOTES QUANTITY OF #12 THHN/THWN CONDUCTORS

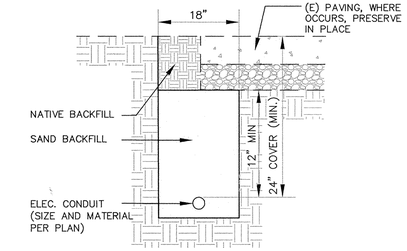
NO CROSS LINE DENOTES 2#12 & 1#12G THHN/THWN CONDUCTORS

CONDUIT SHALL BE 1" MIN U.N.O.



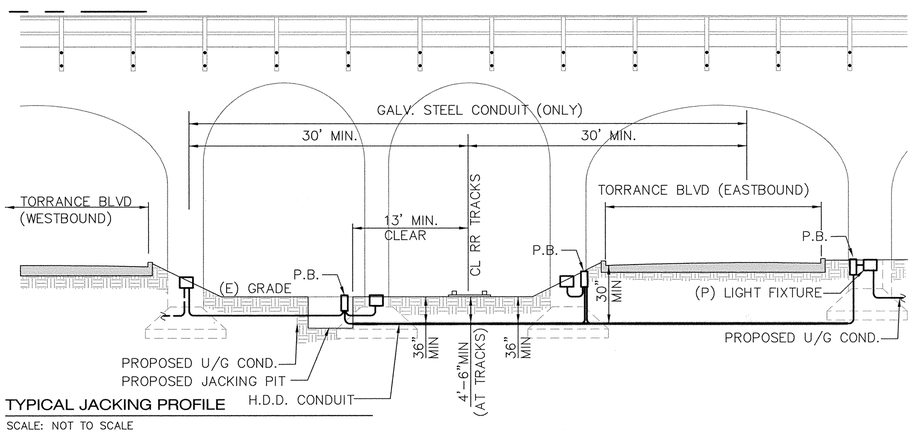
TYPICAL FOOTING CLEARANCES

SCALE: NOT TO SCALE



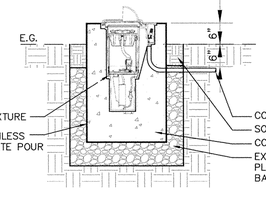
TYPICAL ELECTRICAL TRENCH

SCALE: NOT TO SCALE



TYPICAL JACKING PROFILE

SCALE: NOT TO SCALE



TYPICAL FIXTURE INSTALLATION

SCALE: NOT TO SCALE

DIGALERT
DIAL TOLL FREE 1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE PLOTTED FROM CITY RECORDS. NO ADDITIONAL UTILITY OR SUBSTRUCTURE RESEARCH HAS BEEN PERFORMED. THE CONTRACTOR SHALL DETERMINE THE EXISTENCE AND THE TRUE HORIZONTAL AND VERTICAL LOCATION AND SIZE OF ANY UNDERGROUND UTILITIES OR STRUCTURES AND SHALL BE RESPONSIBLE FOR PROTECTION, ADJUSTMENT, OR DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES SHOWN OR NOT SHOWN HEREON. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR NOTIFYING U.S.A./DIG ALERT AT 1-800-227-2600 FOR UNDERGROUND UTILITY MARKING AT LEAST 48 HOURS PRIOR TO COMMENCING ANY CONSTRUCTION. CONSTRUCTION SHALL NOT COMMENCE PRIOR TO SAID UNDERGROUND UTILITY MARKING.

REGISTERED PROFESSIONAL ENGINEER DANIEL T. BOLTON C63250 EXP. 6/30/14 CIVIL STATE OF CALIFORNIA

Bolton Engineering Corp.
Civil Engineering & Surveying
25834 Narbonne Avenue Suite 210
Lomita, California 90717
(310) 325-5580

REHABILITATION OF THE PACIFIC RAILROAD BRIDGE

REV.	DATE	DESCRIPTION	BY	CHECKED
	4/17			

REGISTERED PROFESSIONAL ENGINEER JOHN J. SEMAAN No. C59226 Exp. 6/30/13 CIVIL STATE OF CALIFORNIA

CITY OF TORRANCE
PUBLIC WORKS DEPARTMENT

DRAWN: D. BOLTON
APPROVED: 7/31/12
DESIGNED: Bolton Engineering Corp.
JOHN J. SEMAAN CITY ENGINEER R.C.E. NO. 59226 DATE EXP. 06/30/13
PROJECT ENGINEER: LEA REIS
PROJECT MANAGER: BETH OVERSTREET
SCALE: AS SHOWN SHEET 18 OF 18
PLAN NO. **EL-1**